

Haier SERVICE MANUAL

Wall Mounted Type DC Inverter SUPER MATCH Model No.1U12BE2ERA HSU12VHGL-W



WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or Repair the product or products dealt with in this service information by anyone else could result in serious injury or death

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Haier Group

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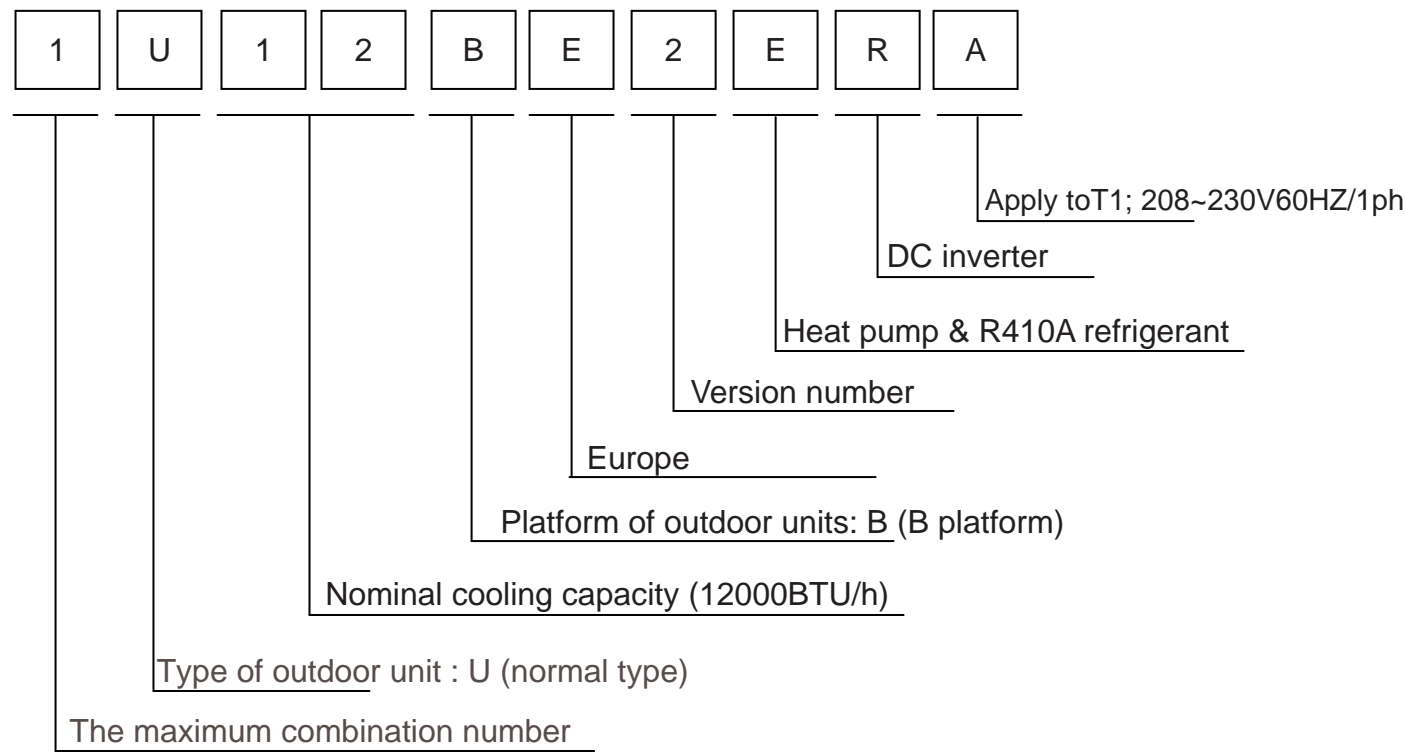
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1 Introduction

1.1 Model name explanation



1.2 Safety Cautions

Be sure to read the following safety cautions before conducting repair work.

The caution items are classified into “Warning” and “Caution”. The “Warning” items are especially important since they can lead to death or serious injury if they are not followed closely. The “Caution” items can also lead

to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety

caution items described below.

About the pictograms

△ This symbol indicates an item for which caution must be exercised.

The pictogram shows the item to which attention must be paid.

○ This symbol indicates a prohibited action.






The prohibited item or action is shown inside or near the symbol.







● This symbol indicates an action that must be taken, or an instruction.

The instruction is shown inside or near the symbol.

After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates Normally, and explain the cautions for operating the product to the customer.



1.2.1 Caution in Repair

Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or cooling machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	


Warning	
Do not repair the electrical components with wet hands . Working on the equipment with wet hands can cause an electrical shock	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shock.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the cooling cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the cooling cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.2.2 Cautions Regarding Products after Repair



Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only


Warning	
<p>Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work.</p> <p>Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.</p>	
<p>Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals.</p> <p>Improper connections can cause excessive heat generation or fire.</p>	
<p>When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable.</p> <p>If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.</p>	
<p>Do not damage or modify the power cable.</p> <p>Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.</p>	
<p>Do not mix air or gas other than the specified refrigerant (R-410A / R22) in the refrigerant system.</p> <p>If air enters the cooling system, an excessively high pressure results, causing equipment damage and injury.</p>	
<p>If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak.</p> <p>If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.</p>	
<p>When replacing the coin battery in the remote controller, be sure to dispose of the old battery to prevent children from swallowing it.</p> <p>If a child swallows the coin battery, see a doctor immediately.</p>	

Caution	
<p>Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.</p>	


Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	

1.2.3 Inspection after Repair

Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	

Warning	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances since it can cause an electrical shock, excessive heat generation or fire.	





Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	

Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 M ohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.2.4 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.2.5 Using Icons List

Icon	Type of Information	Description
 Note	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
 Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, lose data, get an unexpected result or has to restart (part of) a procedure.
 Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

2 Specifications

NOMINAL DISTRIBUTION SYSTEM VOLTAGE		
Phase	/	1
Frequency	Hz	60
Voltage	V	230

NOMINAL CAPACITY and NOMINAL INPUT			
		cooling	heating
Capacity rated	Btu/h	12000 (4780-13300)	13500 (5120-13990)
Power Consumption(Rated)	Btu	4027	4095
EER/COP	Btu/Btu	37.54	37.54
Annual energy consumption	Btuh	706449.6	3801859
Moisture Removal	in ³ /h	40.6 * 10 ⁻⁹	

TECHNICAL SPECIFICATIONS-UNIT				
Dimensions	H*W*D	in	2.56×0.80×1.77	
Packaged Dimensions	H*W*D	in	3.02×1.15×2.03	
Weight	/	lb	68.64	
Gross weight	/	lb	75.24	
Sound level	Sound peessure	dB(A)	62	62
	Sound power	dB(A)	/	/

ELECTRICAL SPECIFICATIONS			
		cooling	heating
Nominal running current	A	5.2	5.7
Maximum running current	A	6.2	6.4
Starting current	A	1.2	1.2

TECHNICAL SPECIFICATIONS-PARTS				
			cooling	heating
Compressor	Type		Rotary Compressor	
	Model		5RS092ZKD21	
	Motor output	Btu	700	
	Oil type		FV50S or equivalent	
	Oil charge volume	gal	0.07	
Fan	Type		Axial fan	
	Motor output	Btu	136.5	
	Air flow rate(high)	in³/h	1118.6	
	Speed(high/low)	rpm	900/300	
Heat exchanger	Type		ML fin- ϕ 9.52HI-HX tube	
	Row*stage*fitch		2*20*1.32	

TECHNICAL SPECIFICATIONS-OTHERS			
Refrigerant circuit	Refrigerant type		R410a
	Refrigerant charge	lb	2.64
	Maximum allowable distance between indoor an outdoor	in	49.2
	Maximum allowable level difference	in	32.8
	Refrigerant control	Capillary	
Piping connections (external diameter)	liquid	in	Φ0.02
	gas	in	Φ0.03
	drain	in	Φ0.05
Heat insulation type		Both liquid and Gas pipes	
Max. piping Length		in	49.2
Max. vertical Difference		in	32.8
Chargeless		in	32.8
Amount of Additional Charge of Refrigerant		g/in	65.6
Intemational Protection degree		IP 24	

Note: the data are based on the conditions shown in the table below

cooling	heating	Piping length
Indoor: 80.6° F DB/66.2° F W B Outdoor: 95° F DB/75.2° F W B	Indoor:68° F DB Outdoor: 44.6° F DB/42.8° F WB	16.4in

Conversation formulae

Kcal/h= KW×860

Btu/h= KW×3414

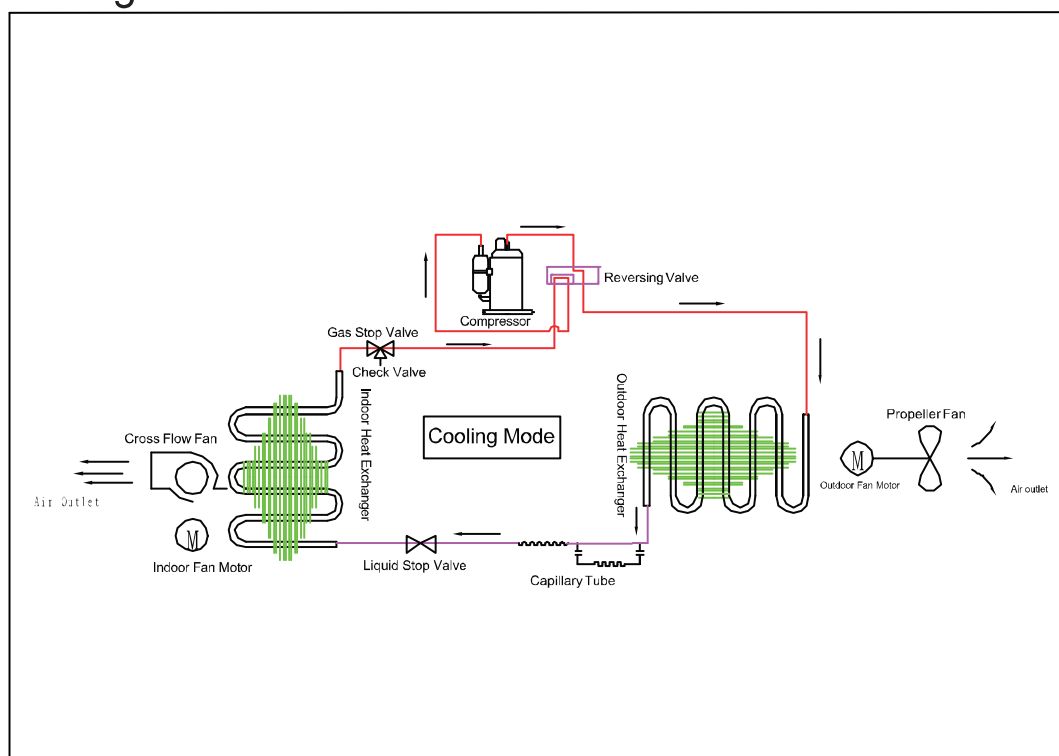
cfm=m³/min×35.3

3. Sensors list

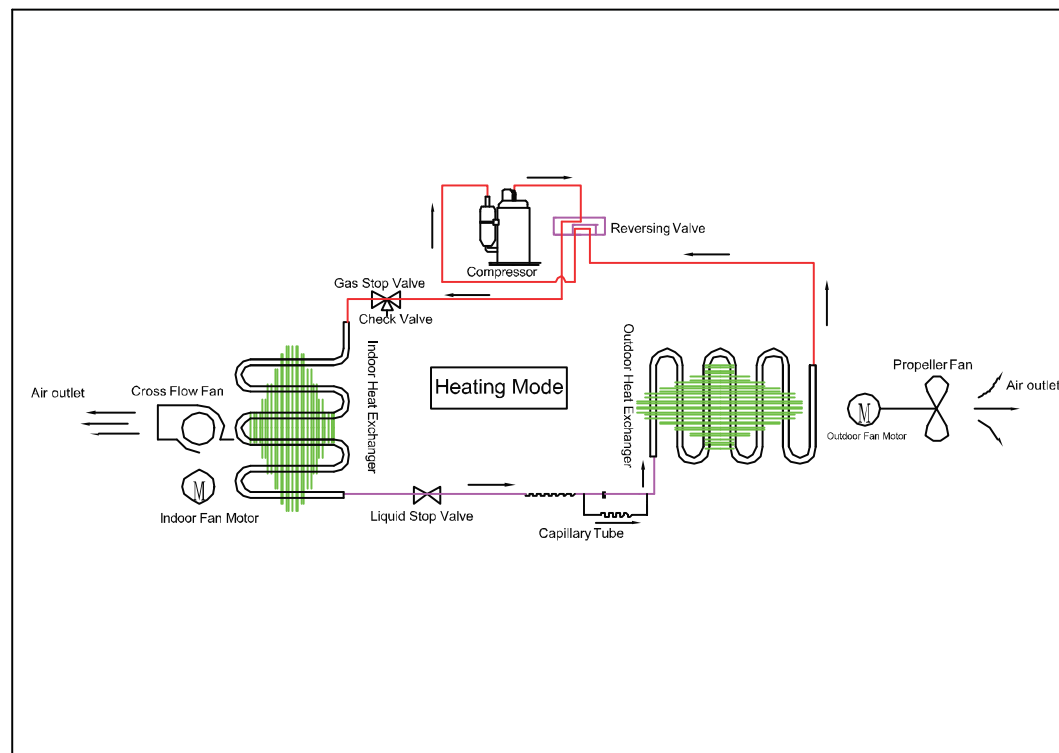
type	Description	Qty
Ambient sensor	Its used for detecting temperature of outdoor side	1
Suction sensor	Its used for detecting suction pipe temperature of compressor to adjust gas flowing	1
Defrosting sensor	Its used for controlling outdoor defrosting at heating mode	1
Descharging sensor	Its used for compressor in case of over-heat	1

4. Pinping diagrams

Cooling mode



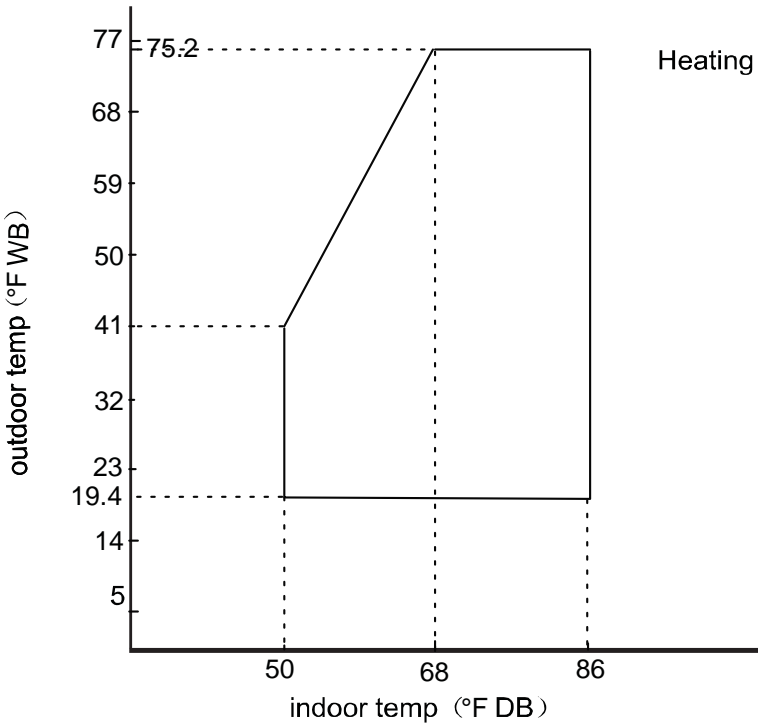
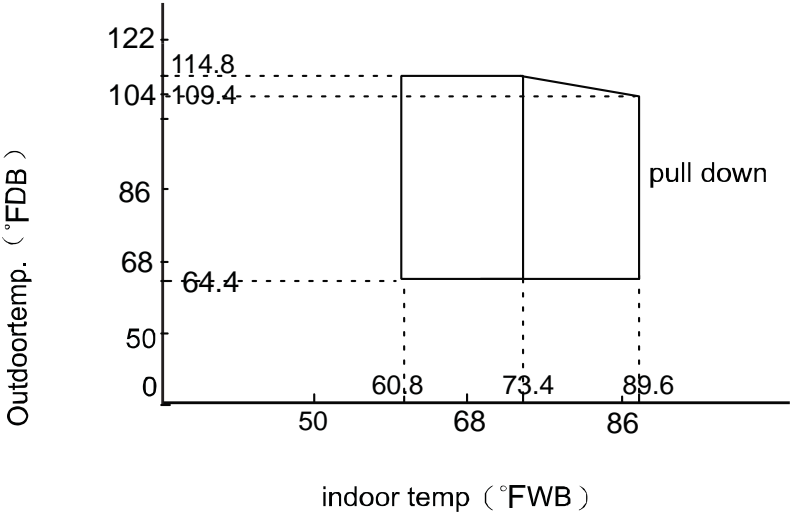
Heating mode



5. Operation range

The name of parts

Cooling



Notes:

The graphs are based on the following condition:
Equivalent piping length 16.4in
Level difference 0in
Air flow rate high

6. Printed Circuit Board Connector Wiring Diagram

Connectors

PCB (1) Control PCB

series	PCB connector	Connect with load
1	CN1	Connector for power N and L
2	CN2	
3	CN3	Connector for ground
4	CN4	Connector for communicate between indoor and outdoor unit
5	CN8	Connector for CN2,CN1 on the module board
6	CN9	
7	CN10	Connector for four way valve coil
8	CN16	Connector for electric expansion valves
9	CN17	Connector for thermistors
10	CN18	
11	CN19	
12	CN20	
13	CN21	Connector for fan motor
14	CN22	Connector for DC POWER 15V and 5V to the module board
15	CN23	Connector for communicate between the control board and the module board
16	CN24	Connector to P and N of the module board
17	CN26	

Note: 09K series needn't connect with CN16 and CN18

PCB (2) Module PCB

series	PCB connector	Connect with load
1	P (CN1)	Connector for capacitance board
2	N (CN5)	
3	LO (CN6)	Connector for reactor
4	LI (CN7)	
5	CN2	Connector for the U, V, W wire of the compressor
6	CN3	
7	CN4	
8	CN10	Connector for the DC power 5V and 15V form the control PCB
9	CN11	Connector for communicate between the control board and the module board

Notes: Other Designations

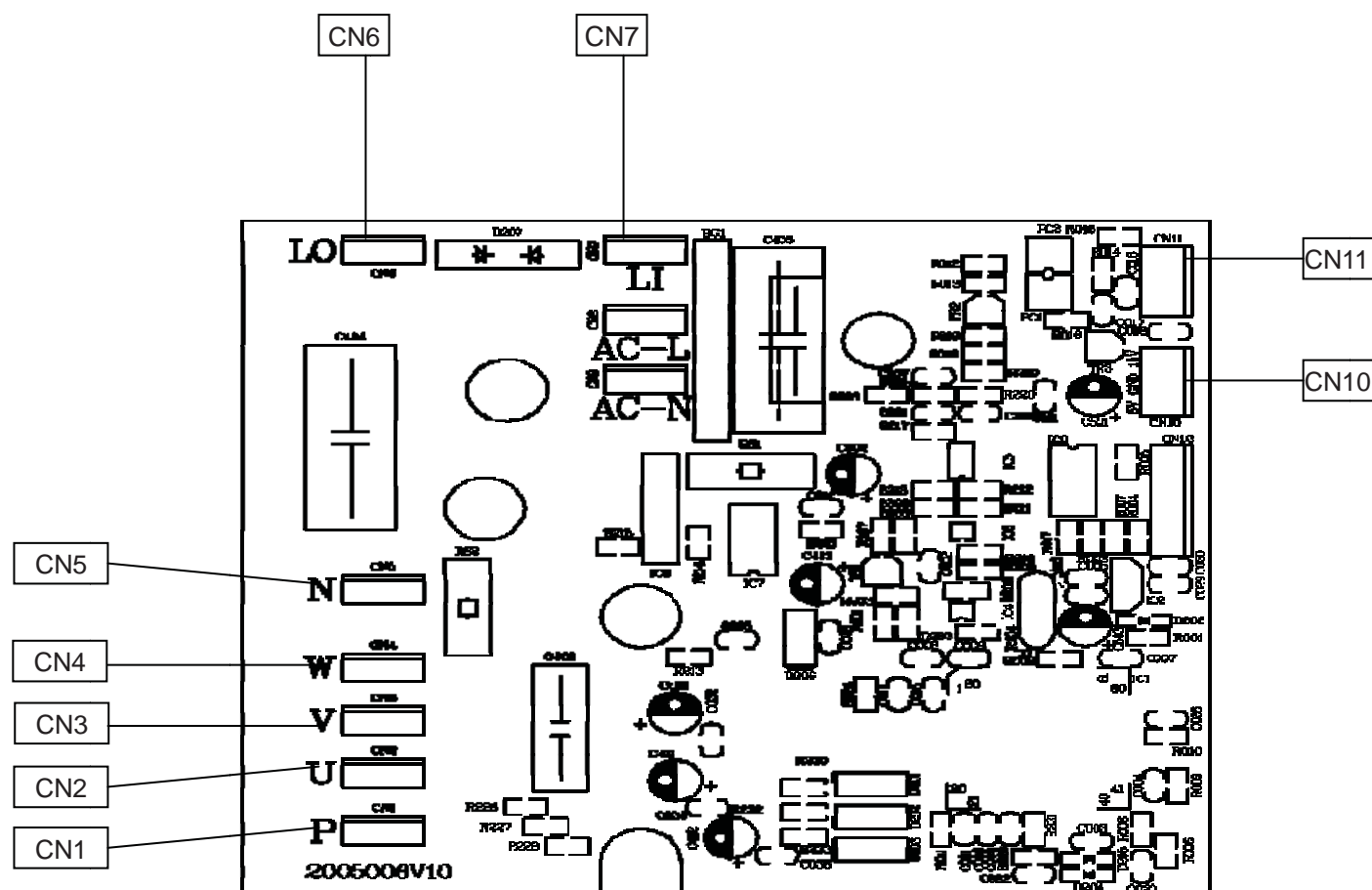
PCB (1) (Control PCB)

1) FUSE 1, (25A, 250VAC); FUSE 2(1A, 250VAC)

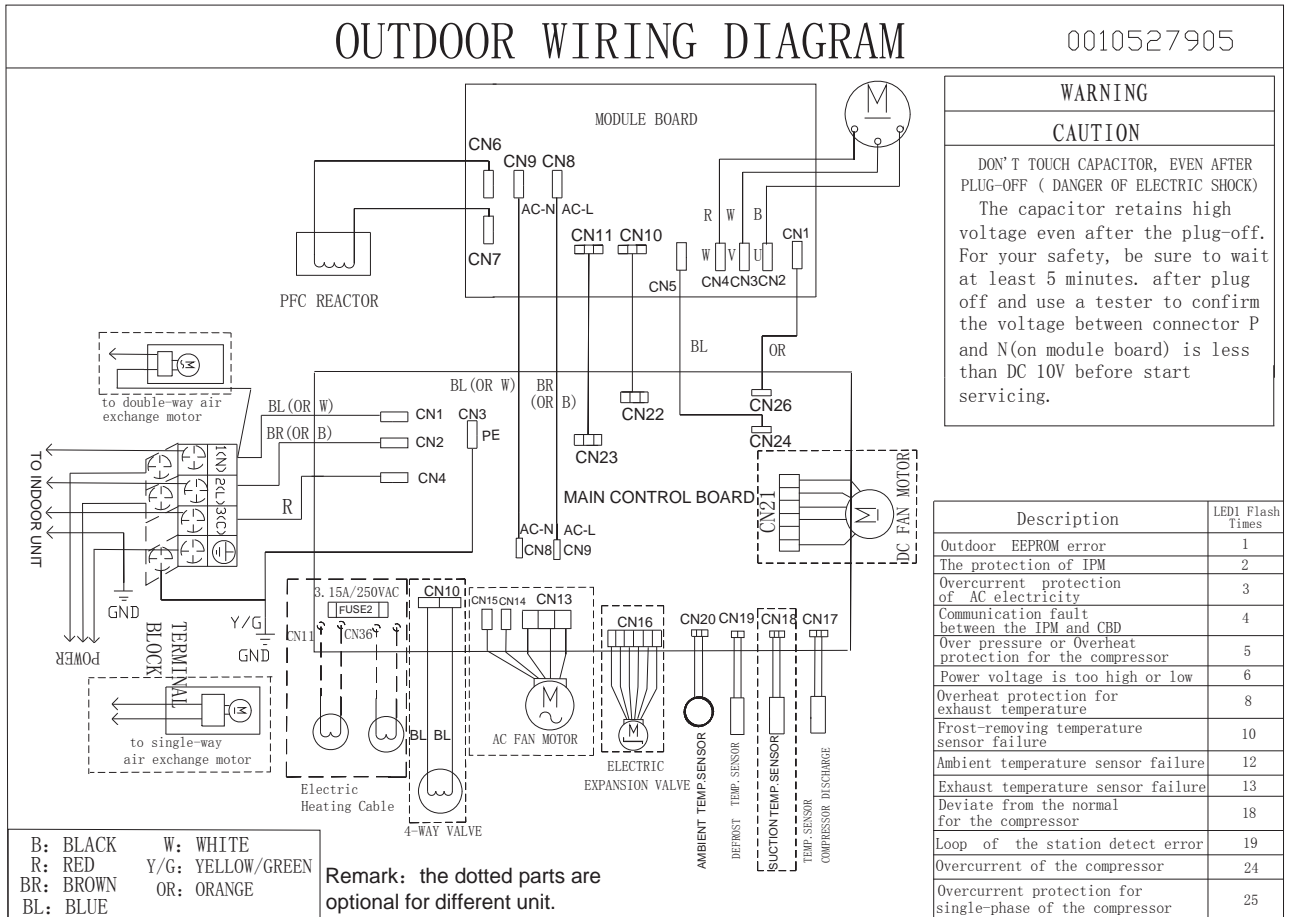
2) LED 1 Keep light representative normal, if keep flash interval representative trouble Alarm

3) RV1, RV2, RV3 Varistor

PCB (2)



Wiring diagrams



7. Functions and Control

7.1 Main functions and control specification

7.1.1 The operation frequency of outdoor unit and its control

7.1.1.1 The operation frequency control of compressor

The operation frequency scope of compressor:

Mode	Minimum operation frequency	Maximum operation frequency
Heating	36Hz	90 Hz
Refrigeration	36Hz	80 Hz

7.1.1.2 The starting of compressor

When the compressor is started for the first time, it must be kept under the conditions of 58Hz, 88Hz for one minute (the overheating protection of the outdoor unit air-blowing temperature, immediately decrease the frequency when the compressor is overflowing and releasing the pressure), then it can be operated towards the target frequency. When the machine runs normally, there's no such process. After starting the compressor for operation, the compressor should run according to the calculated frequency, and every determined frequency for protection should be prior to the calculated frequency.

7.1.1.3 The speeds of increasing or decreasing the frequency of the compressor

The speed of increasing or decreasing the frequency rapidly 1 -----1HZ/second

The speed of increasing or decreasing the frequency slowly 2 -----1HZ/10seconds

7.1.1.4 The calculation of the compressor's frequency

1) The minimum/maximum frequency limitation

A. While cooling: F-MAX-r is the maximum operation frequency of the compressor; F-MIN-r is the minimum operation frequency of the compressor.

B. While heating: F-MAX-d is the maximum operation frequency of the compressor; F-MIN-d is the minimum operation frequency of the compressor.

2) The frequency limitation which is affected by the environment temperature.

(Wh_c= environment temperature)

Heating mode:

Serial No.	Temperature scope	Frequency limitation
1	Wh_F<10.4	Max_hz8 90HZ
2	Wh_F<17.6	Max_hz7 90HZ
3	Wh_F<28.4	Max_hz4 90HZ
4	Wh_F<41	Max_hz5 85HZ
5	Wh_F<50	Max_hz1 80HZ
6	Wh_F<62.6	Max_hz2 70HZ
7	Wh_F<68	Max_hz6 55HZ
8	Wh_F≥68	Max_hz3 45HZ

Remarks: The above are the maximum frequency limitations of the complete appliance which are affected by the environment, and they have nothing to do with the ability of the indoor unit.

Cooling/dehumidification mode:

Serial No.	Temperature scope	Frequency limitation
1	Wh_F<82.4	Max_hz1 46HZ
2	Wh_F<89.6	Max_hz2 72HZ
3	Wh_F<104	Max_hz3 80HZ
4	Wh_F<118.4	Max_hz4 65HZ
5	Wh_F \geq 118.4	Max_hz5 46HZ

Remarks: the above are not only the maximum frequency limitations of the complete appliance which are affected by the environment, but also the maximum ability limitation of the system. When the starting ability is not the maximum, its maximum frequency limitation is calculated by the following equations:

The frequency limitation which is affected by the temperature and under the condition of actual ability=the actual running system ability*the maximum frequency which is limited by the temperature and under the condition of maximum ability/the maximum designing ability of the system

$\Delta T = \sum (\Delta T_i \cdot P_i) / \sum P_i$ ($\Delta T_i = |T_{st_i} - T_{nh_i}|$ the setting temperature - T_{nh_i} the indoor environment temperature); $P_i = i$ the ability of the indoor unit)

Cooling/dehumidification mode:

ΔT	<1	=1	=2	=3	≥ 4
The percentage of the rated frequency P	50%	80%	120%	150%	160%

Heating mode:

ΔT	<1	=1	=2	=3	≥ 4
The percentage of the rated frequency P	50%	70%	120%	150%	170%

The indoor setting airflow speed	Breeze	Low	Medium	High	Strong	Quiet	Healthy airflow
The percentage of the rated frequency K_i	60%	75%	85%	100%	120%	60%	60%

$$K = \sum (K_i \cdot P_i) / \sum P_i$$

The calculation of the actual output frequency:

when there is no healthy airflow: $F = F_{ED} \cdot (\text{rated frequency}) \times P \times K$

When the healthy airflow has been set: $F = F_{ED} \cdot P \times K (\text{airflow speed}) \times K (\text{healthy airflow})$

Notes:

When cooling, it is needed to satisfy

$F_{\text{MIN-d}}(\text{compressor's Min_hz}) < F < F_{\text{MAX-d}}(\text{compressor's Max_hz})$

When heating, it is needed to satisfy

$F_{\text{MIN-r}}(\text{compressor's Min_hz}) < F < F_{\text{MAX-r}}(\text{compressor's Max_hz})$

7.1.2 The outdoor fan control (Exchange fan)

When the fan is changed among every airflow speed (including stop blowing), in order to avoid the airflow speed from skipping frequently, it must be kept under each mode for over 30 seconds, and then it can be changed to another mode (when cooling, the time is changed to 15 seconds).

7.1.2.1 The outdoor fan control when cooling or dehumidifying

After the compressor is started for 5 seconds, the outdoor fan is started at the medium speed at first, after 30 seconds, it begins to control the airflow speed according to the temperature conditions of the outdoor environment.

The temperature of the outdoor air (Ta)	The temperature of the outdoor coil (Te)	Airflow speed
$Ta \geq 86^{\circ} F$	—	High
$78.8^{\circ} F \leq Ta < 86^{\circ} F$	—	Keeping the speed
$75.2^{\circ} F \leq Ta < 78.8^{\circ} F$	—	Medium
$73.4^{\circ} F \leq Ta < 75.2^{\circ} F$	—	Keeping the speed
$50^{\circ} F \leq Ta < 73.4^{\circ} F$	—	Low
$41^{\circ} F \leq Ta < 50^{\circ} F$	—	Keeping the speed
$Ta < 41^{\circ} F$	$59^{\circ} F \leq Te$	Low
	$59^{\circ} F > Te$	Stop

7.1.2.2 The outdoor fan control when heating

The temperature of the outdoor air (Ta)	Airflow speed
$Ta \geq 71.6^{\circ} F$	Low
$66.2^{\circ} F \leq Ta < 71.6^{\circ} F$	Keeping the speed
$60.8^{\circ} F \leq Ta < 71.6^{\circ} F$	Medium
$57.2^{\circ} F \leq Ta < 60.8^{\circ} F$	Keeping the speed
$Ta < 57.2^{\circ} F$	High

7.1.3 Four way control

For the details of defrosting four-way valve control, see the defrosting process.

Four way working in other ways:

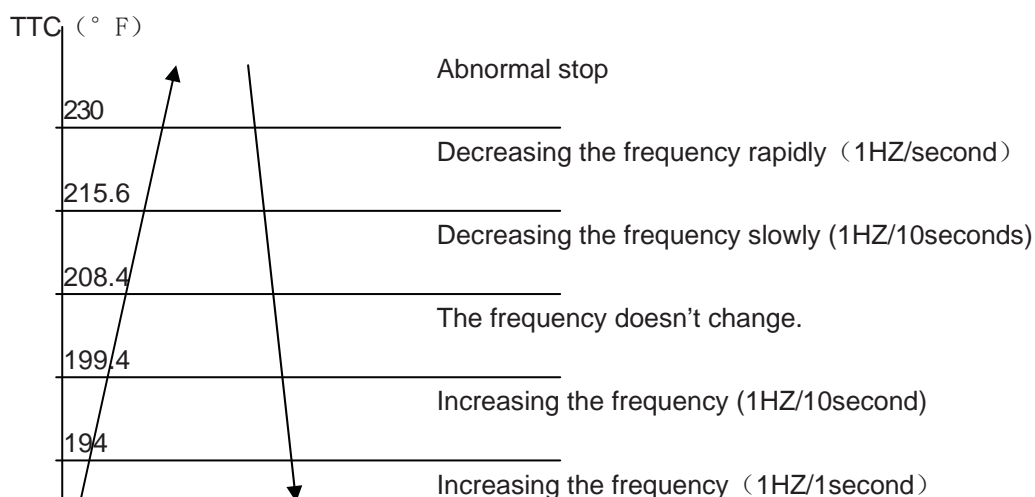
Under the mode of heating, open the four-way valve, when the compressor is not started or changed to non-heating mode, make sure the compressor is stopped for 2 minutes, and then close the four-way valve.

7.1.4 Protection function

7.1.4.1 TTC high temperature-preventing protection

Once the machine is started, it can run TTC(air-blowing temp) overheating protection of air-blowing, but air-blowing sensor malfunction must alarm after 4 minutes during which the compressor is started (during the course of self-detection, there's no such limitation)

Sensor detection methods: 100 times (one cycle of procedure run is one time, and about 5ms, detection method for each time: continuously sampling for 8 times, then order them and take the mean value of the middle 2 values), take the mean value.

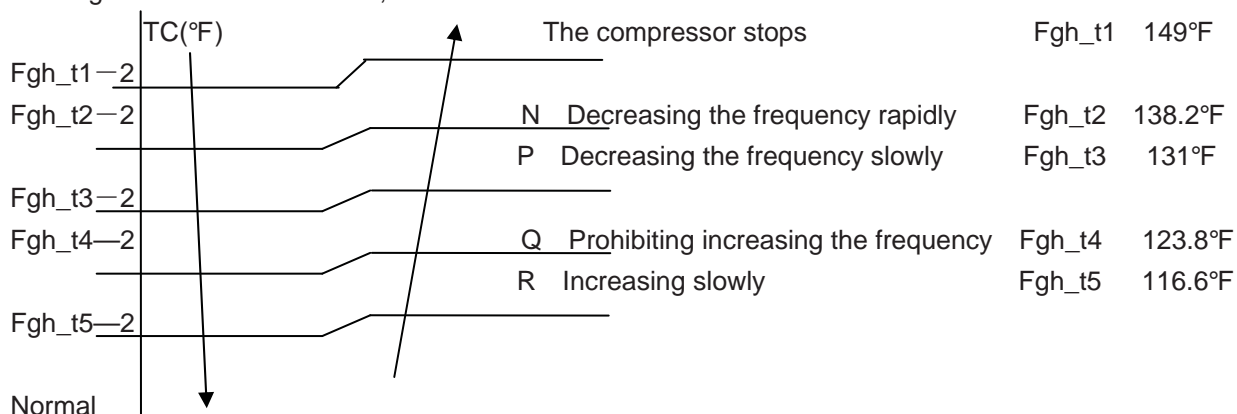


TTC \geq 230°F lasts for 20 seconds. Overheating protection of air-blowing, alarm malfunction to the indoor, others don't last.

7.1.4.2 TC high temperature-preventing control of the indoor heating unit:

Tpg_indoor is the highest value of the effective indoor unit (start it and it is in accord with the running state). TC=indoor coil temp.

The indoor heat exchanger sensor tests the temperature of the indoor heat exchanger. If the temperature is higher than 131°F, decrease the rotate speed of the compressor and do the high temperature-preventing protection of the indoor heat exchanger; if the temperature of the indoor heat exchanger is lower than 116.6°F, recover to the normal control.



N: Decreasing at the speed of 1HZ/1 second

P: Decreasing at the speed of 1Hz/10 seconds

Q: Continue to keep the last-time instruction cycle

R: Increasing at the speed of 1Hz/10seconds

Remarks: the outdoor unit

7.1.4.3 The control of preventing the over current of the compressor:

During the starting process of the compressor, if the current of the compressor is greater than 11A for 3 seconds, stop the compressor and alarm, after 3 minutes, start it again, if such state appears 3 times in 20 minutes, stop the compressor and alarm, and confirm the malfunction. Then continue to run it only after the power is off.

During the starting process of the compressor, if the AC current is greater than 8.5A, the frequency of the compressor decreases at the speed of 1HZ/second.

During the starting process of the compressor, if the AC current is greater than 8A, the frequency of the compressor decreases at the speed of 0.1HZ/second.

During the starting process of the compressor, if the AC current is greater than 7A, the frequency of the compressor increases at the prohibited speed.

During the starting process of the compressor, if the AC current is greater than 6.5A, the frequency of the compressor increases at the speed of no faster than 0.1HZ/second.

7.1.4.4 The protection function of AC current:

During the starting process of the compressor, if the AC current is greater than 12A for 3 seconds, stop the compressor and alarm, after 3 minutes, start it again, if such state appears 3 times in 20 minutes, stop the compressor and alarm, and confirm the malfunction. Then continue to run it only after the the power is off.

During the starting process of the compressor, if the AC current is greater than 9A, the frequency of the compressor decreases at the speed of 1HZ/second.

During the starting process of the compressor, if the AC current is greater than 8A, the frequency of the compressor decreases at the speed of 0.1HZ/second.

During the starting process of the compressor, if the AC current is greater than 7A, the frequency of the compressor increases at the prohibited speed.

During the starting process of the compressor, if the AC current is greater than 6.5A, the frequency of the compressor increases at the speed of no faster than 0.1HZ/second.

Remarks: when the outdoor temperature is high, there's compensation for AC current protection.

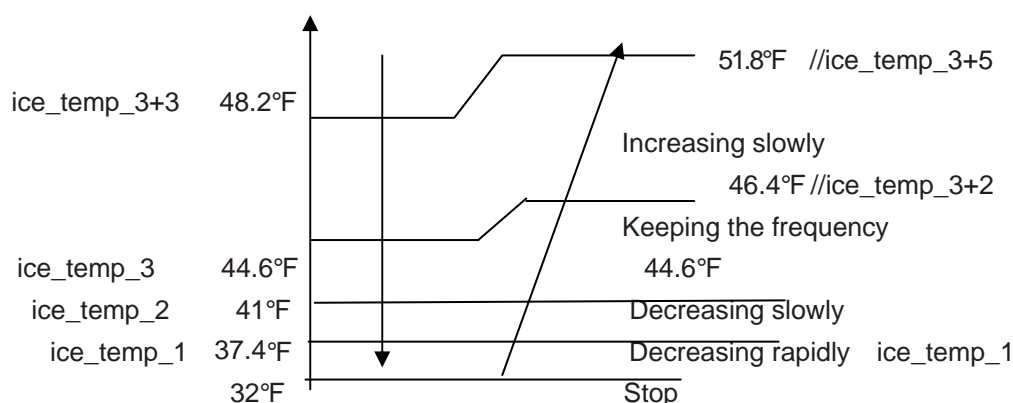
(1) When the outdoor environment temperature is higher than 104°F, AC current protection value decreases by 1A.

(2) When the outdoor environment temperature is higher than 122°F, AC current protection value decreases by 2.5A.

7.1.4.5 Anti-freezing protection of the indoor heat exchanger

When cooling/heating, prevent freezing.

Tpg_indoor is the minimum value of the effective indoor unit (start it and it is in accord with the running state).



When $Tpg_indoor < ice_temp_33.8^{\circ}F$, the frequency of the compressor decreases at the speed of 1HZ/1second.

When $Tpg_indoor < ice_temp_35.6^{\circ}F$, the frequency of the compressor decreases at the speed of 1HZ/10seconds.

When Tpg_indoor begins to rise again, and $ice_temp_2 \leq Tpg_indoor \leq ice_temp_37.4^{\circ}F$, the frequency of the compressor doesn't change.

When $\text{ice_temp_3} < \text{Tpg_indoor} < \text{ice_temp_3} + 37.4^{\circ}\text{F}$, the frequency of the compressor increases at the speed of 1HZ/10seconds.

For example, $\text{Tpg_indoor} \leq 32^{\circ}\text{F}$ last for 2 minutes, and then the outdoor unit will stop, and report underload malfunction, but don't send malfunction report to the indoor.

The compressor stops for more than 3 minutes, $\text{Tpg_indoor} > \text{ice_temp_3} + 35.6^{\circ}\text{F}$, the compressor recovers.

7.1.4.6 The frequency limitation of modification rate

In the field which is controlled by high frequency, if the modification rate is not high enough, the control-driven chip will enter into weak magnetic control, this will help to relieve the problem of modification rate. If during the course of weak magnetic control, the modification rate is still not high enough, enter into the control of decreasing frequency until the alarm of modification rate is relieved.

7.1.4.7 Temperature protection of the outdoor cooling coil

When the defrosting temperature and the sensor's temperature are higher than 149°F , the frequency of the compressor decreases 1hz/10seconds. Keep the frequency until it decreases to the lowest frequency. When the temperatures are lower than 149°F and higher than 140°F , keep the frequency of the compressor. When the temperatures are lower than 140°F , relieve the defrosting temperature protection.

7.1.5 The control of the outdoor Electronic expansion valve (EEV)

(09K series have no this function)

In cooling mode, the EEV opening range is 90~480 steps. The EEV opening is 5 steps when unit is off. In heating mode, the EEV opening range is 60~480 steps. The EEV opening is 45 steps when unit is off.

After outdoor unit is off, the EEV opening keep the current on for 5 s, then open the EEV completely for 2 minutes, then become 5 steps (cooling) or 45 steps (heating).

The EEV opening will increase if SH (superheat degree) > 0 while decrease if SH < 0 .

Adjust frequency:

If $|\text{SH}| = 0$, 60s/ 1 step

If $|\text{SH}| \geq 3$, and $\Delta\text{SH} = 0$, 10s/ 1 step.

If $3 \geq |\text{SH}| \geq 0$, 30s/ 1 step.

$\Delta\text{SH} = \text{current SH} - \text{last SH}$

$\text{SH} = \text{Ts (suction temp)} - \text{Tc1 (indoor coil temp)} - \text{Tsh (fixed data, depend on different models, -1~2)}$

7.2 Value of Thermistor

Ambient Sensor, Defrosting Sensor, Pipe sensor

R77°F=10K Ω \pm 3% B77°F/122°F=3700K \pm 3%

Temp.((°F))	Max.(K Ω)	Normal(K Ω)	Min.(K Ω)	Tolerance(°F)	
-22	165.2170	147.9497	132.3678	28.51	35.15
-20.2	155.5754	139.5600	125.0806	28.53	35.13
-18.4	146.5609	131.7022	118.2434	28.56	35.11
-16.6	138.1285	124.3392	111.8256	28.60	35.08
-14.8	130.2371	117.4366	105.7989	28.63	35.06
-13	122.8484	110.9627	100.1367	28.67	35.04
-11.2	115.9272	104.8882	94.8149	28.71	35.01
-9.4	109.4410	99.1858	89.8106	28.74	34.99
-7.6	103.3598	93.8305	85.1031	28.76	34.95
-5.8	97.6556	88.7989	80.6728	28.80	34.93
-4	92.3028	84.0695	76.5017	28.83	34.92
-2.2	87.2775	79.6222	72.5729	28.87	34.88
-0.4	82.5577	75.4384	68.8710	28.90	34.86
-1.4	78.1230	71.5010	65.3815	28.94	34.83
-3.2	73.9543	67.7939	62.0907	28.98	34.79
-5	70.0342	64.3023	58.9863	29.01	34.77
-6.8	66.3463	61.0123	56.0565	29.05	34.74
-8.6	62.8755	57.9110	53.2905	29.08	34.72
-10.4	59.6076	54.9866	50.6781	29.12	34.68
-12.2	56.5296	52.2278	48.2099	29.16	34.65
-14	53.6294	49.6244	45.8771	29.19	34.63
15.8	50.8956	47.1666	43.6714	29.23	34.59
17.6	48.3178	44.8454	41.5851	29.28	34.56
19.4	45.8860	42.6525	39.6112	29.32	34.52
21.2	43.5912	40.5800	37.7429	29.35	34.50
23	41.4249	38.6207	35.9739	29.39	34.47
24.8	39.3792	36.7676	34.2983	29.43	34.43
26.6	37.4465	35.0144	32.7108	29.46	34.39
28.4	35.6202	33.3552	31.2062	29.52	34.36
30.2	33.8936	31.7844	29.7796	29.55	34.32
32	32.2608	30.2968	28.4267	29.59	34.30
33.8	30.7162	28.8875	27.1431	29.62	34.27

35.6	29.2545	27.5519	25.9250	29.68	34.23
37.4	27.8708	26.2858	24.7686	29.71	34.20
39.2	26.5605	25.0851	23.6704	29.75	34.16
41	25.3193	23.9462	22.6273	29.79	34.12
42.8	24.1432	22.8656	21.6361	29.84	34.09
44.6	23.0284	21.8398	20.6939	29.88	34.05
46.4	21.9714	20.8659	19.7982	29.93	34.02
48.2	20.9688	19.9409	18.9463	29.97	33.96
50	20.0176	19.0621	18.1358	30.00	33.93
51.8	19.1149	18.2270	17.3646	30.06	33.89
53.6	18.2580	17.4331	16.6305	30.09	33.85
55.4	17.4442	16.6782	15.9315	30.15	33.82
57.2	16.6711	15.9601	15.2657	30.18	33.78
59	15.9366	15.2770	14.6315	30.24	33.73
60.8	15.2385	14.6268	14.0271	30.27	33.69
62.6	14.5748	14.0079	13.4510	30.33	33.66
64.4	13.9436	13.4185	12.9017	30.36	33.62
66.2	13.3431	12.8572	12.3778	30.42	33.57
68	12.7718	12.3223	11.8780	30.45	33.53
69.8	12.2280	11.8126	11.4011	30.51	33.49
71.6	11.7102	11.3267	10.9459	30.54	33.44
73.4	11.2172	10.8634	10.5114	30.60	33.40
75.2	10.7475	10.4216	10.0964	30.65	33.35
77	10.3000	10.0000	9.7000	30.65	33.35
78.8	9.8975	9.5974	9.2980	30.63	33.37
80.6	9.5129	9.2132	8.9148	30.56	33.34
82.4	9.1454	8.8465	8.5496	30.49	33.49
84.2	8.7942	8.4964	8.2013	30.43	33.55
86	8.4583	8.1621	7.8691	30.36	33.62
87.8	8.1371	7.8428	7.5522	30.29	33.67
89.6	7.8299	7.5377	7.2498	30.24	33.75
91.4	7.5359	7.2461	6.9611	30.16	33.80
93.2	7.2546	6.9673	6.6854	30.09	33.87
95	6.9852	6.7008	6.4222	30.02	33.93
96.8	6.7273	6.4459	6.1707	29.97	34.00
98.6	6.4803	6.2021	5.9304	29.89	34.05
100.4	6.2437	5.9687	5.7007	29.82	34.12
102.2	6.0170	5.7454	5.4812	29.75	34.20
104	5.7997	5.5316	5.2712	29.68	34.25
105.8	5.5914	5.3269	5.0704	29.61	34.32
107.6	5.3916	5.1308	4.8783	29.53	34.39
109.4	5.2001	4.9430	4.6944	29.46	34.45
111.2	5.0163	4.7630	4.5185	29.39	34.52

113	4.8400	4.5905	4.3500	29.32	34.59
114.8	4.6708	4.4252	4.1887	29.25	34.65
116.6	4.5083	4.2666	4.0342	29.17	34.72
118.4	4.3524	4.1145	3.8862	29.10	34.79
120.2	4.2026	3.9686	3.7443	29.03	34.86
122	4.0588	3.8287	3.6084	28.94	34.92
123.8	3.9206	3.6943	3.4780	28.87	34.99
125.6	3.7878	3.5654	3.3531	28.80	35.06
127.4	3.6601	3.4416	3.2332	28.72	35.13
129.2	3.5374	3.3227	3.1183	28.63	35.20
131	3.4195	3.2085	3.0079	28.56	35.28
132.8	3.3060	3.0989	2.9021	28.49	35.33
134.6	3.1969	2.9935	2.8005	28.40	35.40
136.4	3.0919	2.8922	2.7029	28.33	35.47
138.2	2.9909	2.7948	2.6092	28.26	35.55
140	2.8936	2.7012	2.5193	28.17	35.62
141.8	2.8000	2.6112	2.4328	28.09	35.69
143.6	2.7099	2.5246	2.3498	28.00	35.76
145.4	2.6232	2.4413	2.2700	27.93	35.83
147.2	2.5396	2.3611	2.1932	27.84	35.91
149	2.4591	2.2840	2.1195	27.75	35.98
150.8	2.3815	2.2098	2.0486	27.68	36.05
152.6	2.3068	2.1383	1.9803	27.59	36.12
154.4	2.2347	2.0695	1.9147	27.52	36.21
156.2	2.1652	2.0032	1.8516	27.43	36.28
158	2.0983	1.9393	1.7908	27.34	36.36
159.8	2.0337	1.8778	1.7324	27.27	36.43
161.6	1.9714	1.8186	1.6761	27.18	36.50
163.4	1.9113	1.7614	1.6219	27.09	36.57
165.2	1.8533	1.7064	1.5697	27.00	36.64
167	1.7974	1.6533	1.5194	26.91	36.73
168.8	1.7434	1.6021	1.4710	26.82	36.81
170.6	1.6913	1.5528	1.4243	26.74	36.88
172.4	1.6409	1.5051	1.3794	26.65	36.95
174.2	1.5923	1.4592	1.3360	26.56	37.04
176	1.5454	1.4149	1.2942	26.47	37.11
177.8	1.5000	1.3721	1.2540	26.38	37.18
179.6	1.4562	1.3308	1.2151	26.29	37.27
181.4	1.4139	1.2910	1.1776	26.20	37.35
183.2	1.3730	1.2525	1.1415	26.11	37.42
185	1.3335	1.2153	1.1066	26.02	37.51
186.8	1.2953	1.1794	1.0730	25.92	37.58
188.6	1.2583	1.1448	1.0405	25.83	37.67

190.4	1.2226	1.1113	1.0092	25.74	37.74
192.2	1.1880	1.0789	0.9789	25.65	37.83
194	1.1546	1.0476	0.9497	25.56	37.90
195.8	1.1223	1.0174	0.9215	25.45	37.99
197.6	1.0910	0.9882	0.8942	25.36	38.07
199.4	1.0607	0.9599	0.8679	25.27	38.16
201.2	1.0314	0.9326	0.8424	25.16	38.23
203	1.0030	0.9061	0.8179	25.07	38.32
204.8	0.9756	0.8806	0.7941	24.98	38.39
206.6	0.9490	0.8558	0.7711	24.87	38.48
208.4	0.9232	0.8319	0.7489	24.78	38.55
210.2	0.8983	0.8088	0.7275	24.67	38.64
212	0.8741	0.7863	0.7067	24.58	38.73
213.8	0.8507	0.7646	0.6867	24.48	38.80
215.6	0.8281	0.7436	0.6672	24.39	38.89
217.4	0.8061	0.7233	0.6484	24.28	38.98
219.2	0.7848	0.7036	0.6303	24.19	39.06
221	0.7641	0.6845	0.6127	24.08	39.15
222.8	0.7441	0.6661	0.5957	23.97	39.24
224.6	0.7247	0.6482	0.5792	23.88	39.33
226.4	0.7059	0.6308	0.5632	23.77	39.42
228.2	0.6877	0.6140	0.5478	23.67	39.49
230	0.6700	0.5977	0.5328	23.56	39.58
231.8	0.6528	0.5820	0.5183	23.47	39.67
233.6	0.6361	0.5667	0.5043	23.36	39.76
235.4	0.6200	0.5518	0.4907	23.25	39.85
237.2	0.6043	0.5374	0.4775	23.14	39.94
239	0.5891	0.5235	0.4648	23.04	40.01
240.8	0.5743	0.5100	0.4524	22.93	40.10
242.6	0.5600	0.4968	0.4404	22.82	40.19
244.4	0.5460	0.4841	0.4288	22.71	40.28
246.2	0.5325	0.4717	0.4175	22.60	40.37
248	0.5194	0.4597	0.4066	22.50	40.46

Discharging Sensor

R176°F=50K $\Omega \pm 3\%$ B77/176°F=4450K $\pm 3\%$

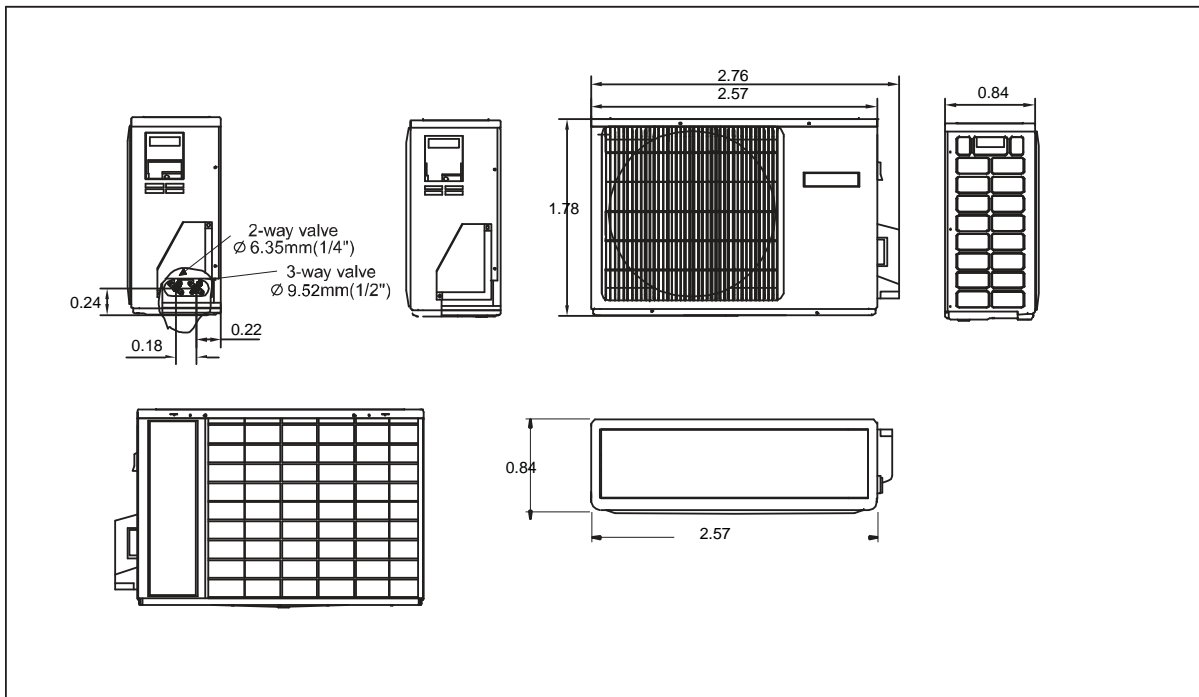
Temp.((°F))	Max.(K Ω)	Normal(K Ω)	Min.(K Ω)	Tolerance(°F)	
-22	14646.0505	12061.7438	9924.4999	26.67	36.41
-20.2	13654.1707	11267.8730	9290.2526	26.69	36.39
-18.4	12735.8378	10531.3695	8700.6388	26.73	36.39
-16.6	11885.1336	9847.7240	8152.2338	26.74	36.37
-14.8	11096.6531	9212.8101	7641.8972	26.76	36.36
-13	10365.4565	8622.8491	7166.7474	26.78	36.36
-11.2	9687.0270	8074.3787	6724.1389	26.82	36.34
-9.4	9057.2314	7564.2244	6311.6413	26.83	36.34
-7.6	8472.2852	7089.4741	5927.0206	26.85	36.32
-5.8	7928.7217	6647.4547	5568.2222	26.89	36.30
-4	7423.3626	6235.7109	5233.3554	26.90	36.30
-2.2	6953.2930	5851.9864	4920.6791	26.92	36.28
-0.4	6515.8375	5494.2064	4628.5894	26.96	36.27
-1.4	6108.5393	5160.4621	4355.6078	26.98	36.27
-3.2	5729.1413	4848.9963	4100.3708	27.01	36.25
-5	5375.5683	4558.1906	3861.6201	27.03	36.23
-6.8	5045.9114	4286.5535	3638.1938	27.05	36.21
-8.6	4738.4141	4032.7098	3429.0191	27.09	36.21
-10.4	4451.4586	3795.3910	3233.1039	27.10	36.19
-12.2	4183.5548	3573.4260	3049.5312	27.14	36.18
-14	3933.3289	3365.7336	2877.4527	27.16	36.16
15.8	3699.5139	3171.3148	2716.0828	27.19	36.14
17.6	3480.9407	2989.2460	2564.6945	27.21	36.12
19.4	3276.5302	2818.6731	2422.6139	27.25	36.10
21.2	3085.2854	2658.8058	2289.2164	27.27	36.10
23	2906.2851	2508.9126	2163.9230	27.30	36.09
24.8	2738.6777	2368.3158	2046.1961	27.32	36.06
26.6	2581.6752	2236.3876	1935.5371	27.36	36.05
28.4	2434.5487	2112.5459	1831.4826	27.39	36.03
30.2	2296.6230	1996.2509	1733.6024	27.41	36.01
32	2167.2730	1887.0018	1641.4966	27.45	36.00
33.8	2045.9191	1784.3336	1554.7931	27.46	35.98
35.6	1932.0242	1687.8144	1473.1460	27.50	35.96
37.4	1825.0899	1597.0431	1396.2333	27.54	35.94
39.2	1724.6540	1511.6468	1323.7551	27.55	35.91
41	1630.2870	1431.2787	1255.4324	27.59	35.89
42.8	1541.5904	1355.6163	1191.0048	27.63	35.87
44.6	1458.1938	1284.3593	1130.2298	27.66	35.85
46.4	1379.7528	1217.2282	1072.8813	27.68	35.83
48.2	1305.9472	1153.9626	1018.7481	27.72	35.82

50	1236.4792	1094.3200	967.6334	27.75	35.80
51.8	1171.0715	1038.0743	919.3533	27.77	35.76
53.6	1109.4661	985.0146	873.7359	27.81	35.74
55.4	1051.4226	934.9440	830.6210	27.84	35.73
57.2	996.7169	887.6792	789.8583	27.88	35.71
59	945.1404	843.0486	751.3077	27.91	35.67
60.8	896.4981	800.8922	714.8380	27.93	35.65
62.6	850.6086	761.0603	680.3265	27.97	35.64
64.4	807.3024	723.4134	647.6580	28.00	35.60
66.2	766.4212	687.8205	616.7252	28.04	35.58
68	727.8172	654.1596	587.4271	28.08	35.56
69.8	691.3524	622.3161	559.6694	28.11	35.53
71.6	656.8979	592.1831	533.3634	28.15	35.51
73.4	624.3328	563.6604	508.4261	28.18	35.47
75.2	593.5446	536.6540	484.7796	28.22	35.46
77	564.4275	511.0760	462.3510	28.24	35.42
78.8	536.9865	486.9352	441.1516	28.27	35.40
80.6	511.0105	464.0500	421.0258	28.31	35.37
82.4	486.4151	442.3499	401.9146	28.35	35.35
84.2	463.1208	421.7683	383.7626	28.38	35.31
86	441.0535	402.2430	366.5175	28.42	35.29
87.8	420.1431	383.7151	350.1301	28.45	35.26
89.6	400.3242	366.1295	334.5542	28.49	35.24
91.4	381.5350	349.4341	319.7460	28.53	35.20
93.2	363.7176	333.5801	305.6645	28.58	35.17
95	346.8176	318.5216	292.2709	28.62	35.15
96.8	330.7839	304.2151	279.5286	28.65	35.11
98.6	315.5682	290.6199	267.4031	28.69	35.08
100.4	301.1254	277.6976	255.8620	28.72	35.06
102.2	287.4128	265.4119	244.8745	28.76	35.02
104	274.3905	253.7288	234.4118	28.80	34.99
105.8	262.0206	242.6161	224.4465	28.83	34.95
107.6	250.2676	232.0436	214.9529	28.87	34.93
109.4	239.0983	221.9825	205.9065	28.92	34.90
111.2	228.4809	212.4060	197.2844	28.96	34.86
113	218.3860	203.2887	189.0648	28.99	34.83
114.8	208.7855	194.6066	181.2273	29.03	34.79
116.6	199.6531	186.3369	173.7524	29.07	34.77
118.4	190.9639	178.4584	166.6217	29.12	34.74
120.2	182.6945	170.9508	159.8181	29.16	34.70
122	174.8228	163.7951	153.3249	29.19	34.66
123.8	167.3280	156.9733	147.1268	29.25	34.63
125.6	160.1904	150.4683	141.2090	29.28	34.59
127.4	153.3914	144.2641	135.5577	29.32	34.56
129.2	146.9136	138.3454	130.1598	29.35	34.52

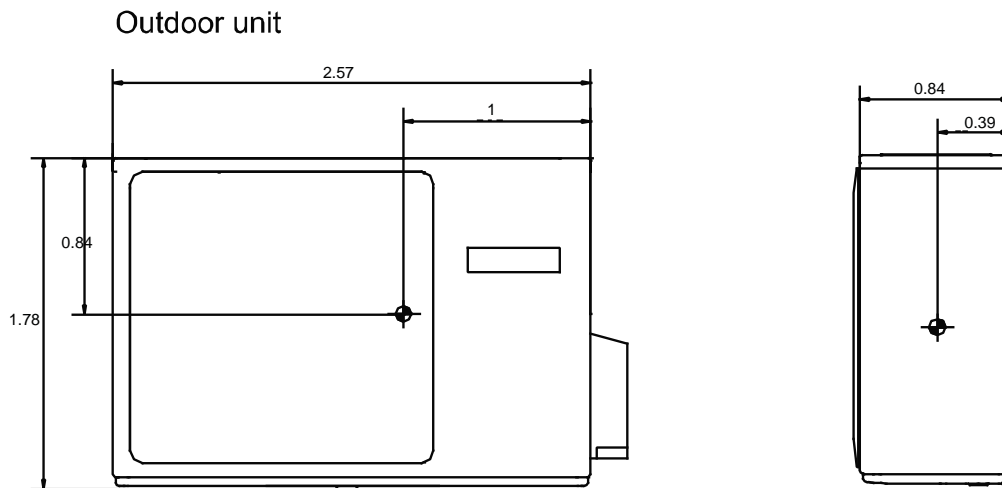
131	140.7403	132.6980	125.0027	29.41	34.48
132.8	134.8559	127.3081	120.0746	29.44	34.45
134.6	129.2457	122.1630	115.3645	29.48	34.41
136.4	123.8956	117.2504	110.8618	29.53	34.38
138.2	118.7926	112.5589	106.5564	29.57	34.34
140	113.9241	108.0776	102.4388	29.62	34.30
141.8	109.2784	103.7961	98.5000	29.66	34.27
143.6	104.8443	99.7046	94.7315	29.70	34.21
145.4	100.6112	95.7939	91.1253	29.75	34.18
147.2	96.5692	92.0553	87.6735	29.79	34.14
149	92.7088	88.4805	84.3690	29.84	34.12
150.8	89.0211	85.0614	81.2048	29.88	34.07
152.6	85.4976	81.7908	78.1744	29.93	34.02
154.4	82.1303	78.6615	75.2715	29.97	33.98
156.2	78.9116	75.6668	72.4902	30.02	33.94
158	75.8343	72.8004	69.8249	30.06	33.91
159.8	72.8916	70.0561	67.2703	30.11	33.85
161.6	70.0770	67.4283	64.8213	30.15	33.82
163.4	67.3844	64.9115	62.4731	30.20	33.78
165.2	64.8080	62.5006	60.2211	30.24	33.73
167	62.3423	60.1906	58.0609	30.29	33.69
168.8	59.9821	57.9770	55.9885	30.34	33.66
170.6	57.7223	55.8552	53.9998	30.38	33.60
172.4	55.5583	53.8210	52.0912	30.43	33.57
174.2	53.4856	51.8706	50.2591	30.47	33.51
176	51.5000	50.0000	48.5000	30.47	33.51
177.8	49.7063	48.2057	46.7083	30.47	33.53
179.6	47.9835	46.4842	44.9911	30.40	33.60
181.4	46.3286	44.8323	43.3452	30.33	33.62
183.2	44.7385	43.2468	41.7672	30.27	33.71
185	43.2105	41.7248	40.2540	30.20	33.78
186.8	41.7386	40.2604	38.7996	30.15	33.84
188.6	40.3241	38.8545	37.4048	30.07	33.91
190.4	38.9643	37.5045	36.0668	30.00	33.96
192.2	37.6569	36.2078	34.7831	29.95	34.03
194	36.3996	34.9622	33.5513	29.88	34.09
195.8	35.1903	33.7653	32.3689	29.80	34.14
197.6	34.0269	32.6151	31.2338	29.73	34.21
199.4	32.9075	31.5096	30.1438	29.66	34.29
201.2	31.8302	30.4467	29.0970	29.61	34.34
203	30.7933	29.4246	28.0915	29.53	34.41
204.8	29.7950	28.4417	27.1254	29.46	34.47
206.6	28.8337	27.4961	26.1970	29.39	34.54
208.4	27.9078	26.5864	25.3048	29.32	34.59
210.2	27.0160	25.7110	24.4470	29.25	34.66

212	26.1569	24.8685	23.6222	29.17	34.74
213.8	25.3290	24.0574	22.8291	29.10	34.79
215.6	24.5311	23.2765	22.0662	29.03	34.86
217.4	23.7620	22.5245	21.3323	28.96	34.93
219.2	23.0205	21.8002	20.6261	28.89	34.99
221	22.3055	21.1025	19.9465	28.81	35.06
222.8	21.6159	20.4303	19.2924	28.74	35.13
224.6	20.9508	19.7825	18.6626	28.67	35.19
226.4	20.3091	19.1582	18.0563	28.60	35.26
228.2	19.6899	18.5564	17.4723	28.53	35.33
230	19.0924	17.9761	16.9098	28.44	35.40
231.8	18.5157	17.4166	16.3680	28.36	35.47
233.6	17.9590	16.8769	15.8458	28.29	35.53
235.4	17.4214	16.3564	15.3427	28.22	35.60
237.2	16.9023	15.8542	14.8577	28.13	35.67
239	16.4010	15.3696	14.3902	28.06	35.74
240.8	15.9167	14.9020	13.9394	27.99	35.82
242.6	15.4489	14.4506	13.5047	27.91	35.89
244.4	14.9968	14.0149	13.0855	27.82	35.94
246.2	14.5599	13.5942	12.6811	27.75	36.01
248	14.1376	13.1879	12.2909	27.66	36.09
249.8	13.7294	12.7955	11.9144	27.59	36.16
251.6	13.3347	12.4165	11.5510	27.50	36.23
253.4	12.9531	12.0503	11.2003	27.43	36.30
255.2	12.5840	11.6965	10.8617	27.36	36.37
257	12.2270	11.3545	10.5348	27.27	36.45
258.8	11.8817	11.0240	10.2191	27.18	36.52
260.6	11.5475	10.7046	9.9142	27.10	36.59
262.4	11.2242	10.3957	9.6197	27.01	36.66
264.2	10.9112	10.0970	9.3352	26.94	36.73
266	10.6084	9.8082	9.0602	26.85	36.81
267.8	10.3151	9.5288	8.7945	26.76	36.88
269.6	10.0312	9.2586	8.5378	26.69	36.95
271.4	9.7563	8.9971	8.2895	26.60	37.04
273.2	9.4901	8.7441	8.0495	26.51	37.11
275	9.2322	8.4993	7.8175	26.44	37.18
276.8	8.9824	8.2623	7.5931	26.35	37.26
278.6	8.7404	8.0329	7.3760	26.26	37.33
280.4	8.5059	7.8108	7.1660	26.17	37.40
282.2	8.2787	7.5958	6.9629	26.08	37.47
284	8.0584	7.3875	6.7664	26.01	37.56

8. Dimensional drawings



9. Center of gravity



Installation Manual of Room Air Conditioner

Preparation

Necessary Tools for Installation

- Hammer
- Nipper
- Hacksaw
- Hole core drill
- Spanner(0.67,0.75 and 1.02in)
- Gas leakage detector or soap-and-water solution
- Torque wrench (0.67 in,0.87in,1.02in)
- Pipe cutter
- Flaring tool
- Knife
- Measuring tape
- Reamer

Power Source

- All wiring to the unit must be in accordance with the National Electric code and local ordinances.

Selection of Installation Place

Indoor Unit - Select a location that is

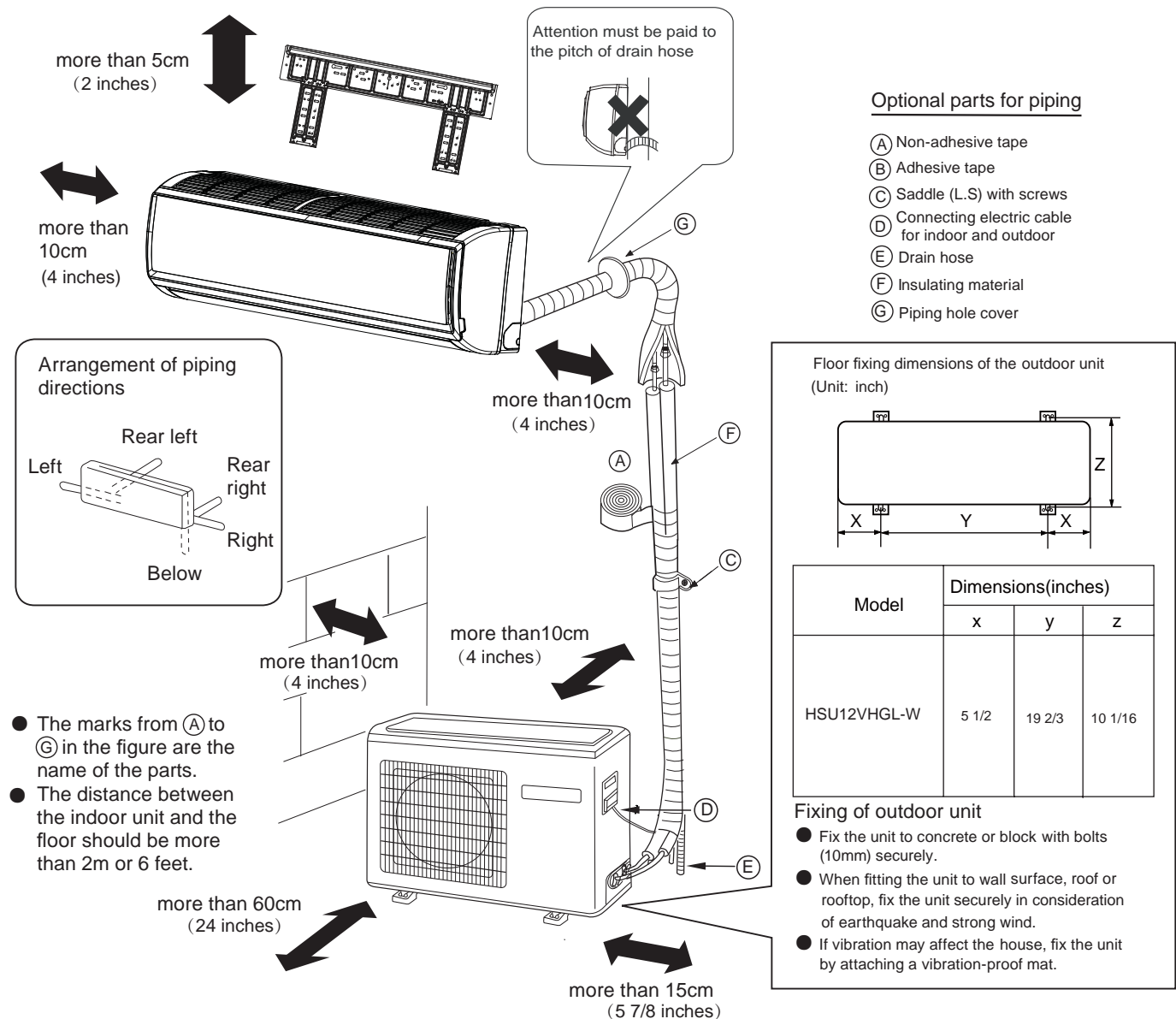
- Robust not causing vibration, where the unit can be supported sufficiently.
- Not affected by heat or steam generated in the vicinity, and where the inlet and outlet of the unit are not disturbed.
- Possible to drain easily, and where piping can be connected with the outdoor unit.
- Where conditioned air can be spread in a room evenly.
- Place where the distance of more than 1m from televisions, radios, wireless apparatuses and fluorescent lamps 3 feet or approximately.
- In the case of fixing the remote controller on a wall, place where the indoor unit can receive signals when the fluorescent lamps in the room are in use.

Outdoor Unit - Select a location that is

- Less affected by rain or direct sunlight and is sufficiently ventilated.
- Strong enough to bear the unit, where vibration and noise are not increased.
- Not causing a nuisance to neighbors due to discharged air or noise.
- A distance marked ↔ is available as illustrated in the below figure.

Drawing for the installation of indoor and outdoor units

The models adopt HFC free refrigerant R410A



The above picture is for reference only. Your product may look different.

Read this manual before installation

Explain the operation of the unit to the user according to this manual

Accessory parts

Remote controller (1)	Drain hose (1)
AAA dry battery (2)	Cushion (4)
Mounting plate (1)	Drain-elbow (1)
Plastic cap (4)	Pipe supporting plate (1)
Ø4X25 Screw (4)	

Selection of pipe

Model	Liquid pipe (Ø)	Gas pipe (Ø)
HSU12VHGL-W	6.35mm (1/4")	9.52mm (3/8")

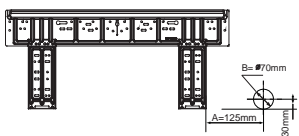
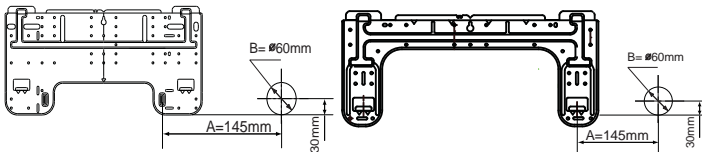
NOTE: The thickness of the pipe must be 0.8mm(1/16") at least.

Indoor unit

1 Fitting of the Mounting Plate and Positioning of the wall Hole

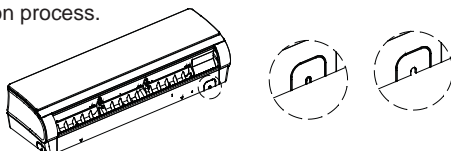
When the mounting plate is first fixed

1. Carry out, based on the wall studs or lintels, a proper leveling for the plate to be fixed against the wall, then temporarily fasten the plate with one nail.
2. Ensure the proper level of the plate, by hanging a thread with a weight from the central top of the plate, then fasten the plate.
3. Find the wall hole location A using a measuring tape



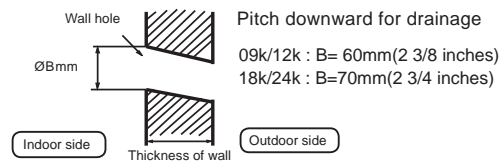
Pay attention to the following points before installation of machine:

1. Take out cushion blocks on the left and right angle beads as shown in the following Figure.
2. Remove 2 gaskets under the cross-flow fan.
3. Clean the burr on the surface of fracture to avoid the power wire from being scratched after removing the virtual opening of the outgoing line slot on the case by hands in indoor power-on process.



2 Making a Hole on the Wall and Fitting the Piping Hole Cover

- Make a hole of B mm / inches in diameter, slightly descending to outside the wall.
- Install piping hole cover and seal it off with putty after installation



(Section of wall hole) (C) Piping hole pipe

3 Installation of the Indoor Unit

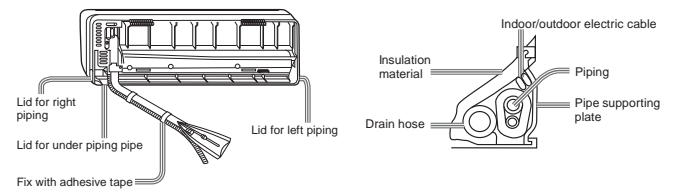
Drawing of pipe

[Rear piping]

- Draw pipes and the drain hose, then fasten them with the adhesive tape

[Left · Left-rear piping]

- In case of left side piping, cut away, with a nipper, the lid for left piping.
 - In case of left-rear piping, bend the pipes according to the piping direction to the mark of hole for left-rear piping which is marked on insulation materials.
1. Insert the drain hose into the cavity of heat insulation materials of indoor unit.
 2. Insert the indoor/outdoor electric cable from backside of indoor unit, and pull it out on the front side, then connect them.
 3. Coat the flaring seal face with refrigerant oil and connect pipes.
- Cover the tubing connection with insulation materials closely, and with adhesive tape.



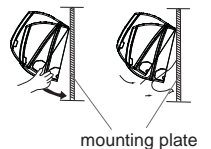
- Indoor/outdoor electric cable and drain hose must be bound with refrigerant piping with adhesive.

[Other direction piping]

- Cut away, with a nipper, the lid for piping according to the piping direction and then bend the pipe according to the position of wall hole. When bending, be careful not to crush pipes.
- Make sure that the wires connecting the indoor and outdoor units are not covered by the refrigeration piping insulation and are long enough to connect to the terminal block on the indoor unit.

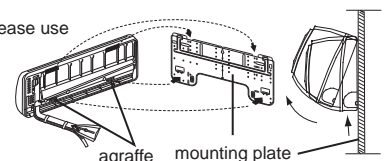
Fixing the indoor unit body

- Hang the unit body onto the upper notches of the mounting plate. Move the body from side to side to verify its secure fixing.
- In order to fix the body onto the mounting plate, hold up the body from the underside and then put it down perpendicularly.



Unloading of indoor unit body

- When you unload the indoor unit, please use your hand to raise the body, then lift the bottom of the body outward slightly and lift the unit until it leaves the mounting plate.



4 Connecting the indoor/outdoor Electric Cable

Removing the wiring cover

- Remove terminal cover at right bottom corner of indoor unit, then take off wiring cover by removing its screws.



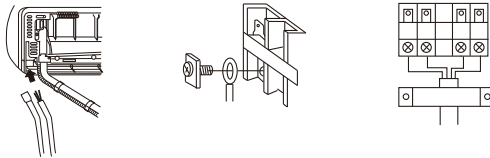
When connecting the cable after installing the indoor unit

1. Insert the cable from the outside into the unit through the same hole that has the interconnecting tubing.
2. Pull out the cable on the front side, and connect the cable making a loop.

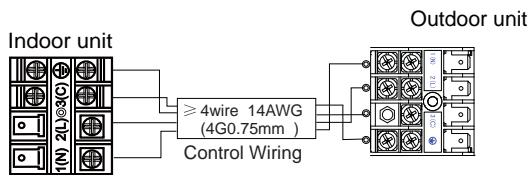


When connecting the cable before installing the indoor unit

- Insert the cord from the back side of the unit, then pull it out on the front side.
- Fasten the unit wire harness to the conduit holder using the lock nut.
- Position the conduit holder to its original state using screw.



Note When connecting the cable, confirm the terminal number of indoor and outdoor units carefully. If wiring is not correct, the unit will not operate properly and could cause a defect.



HSU12VHGL-W

Power cable: \geq 3wire with ground 14AWG

1. If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similar qualified person. The type of connecting wire is H05RN-F or H07RN-F.
2. If the fuse on PC board is broken please change it with the type of T.3.15A/250VAC (Indoor), T.25A/250VAC (Outdoor).
3. The wiring method should be in line with the local wiring standard.
4. Use an HVACR circuit breaker or time delay fuse.

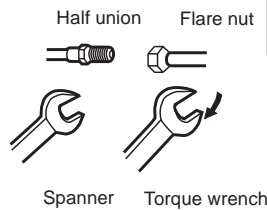
Outdoor unit

1 Installation of Outdoor Unit

Install according to the instructions on the 1st page of this manual

2 Connection of pipes

- When bending the interconnect tubing, ensure the radius is at least 1 1/4" to 1 3/4", 30mm to 40mm to ensure against crushing the tubing.
- Connecting the pipe of gas side first makes working easier.
- Ensure the interconnecting tubing is approved for R410A.

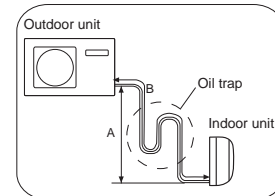
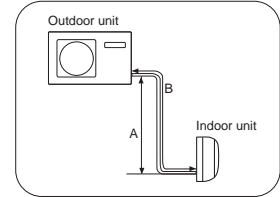
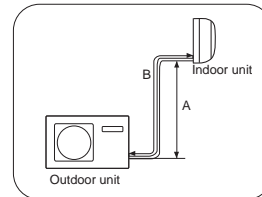


Forced fastening without careful centering may damage the threads and cause a leakage of gas.

Pipe Diameter(ϕ)	Fastening torque
Liquid side 6.35mm (1/4")	18N.m/13.3Ft.lbs
Liquid/Gas side 9.52mm (3/8")	42 N.m/30.1Ft.lbs
Gas side 12.7mm (1/2")	55N.m/40.6Ft.lbs
Gas side 15.88mm (5/8")	60 N.m/44.3Ft.lbs

Ensure that no dirt or debris enters the tubing. The standard tubing length is 25 ft/7.5M. If a different length is required, adjust the refrigerant amount by 1/2 oz/ft, 50 g/M for the 9k, 12k and 18k models. For the 24k model, adjust by 1/2 oz/ft, 50 g/M. Before opening the service valves, evacuate the interconnecting tubing and indoor unit. Follow the instruction in section 5 on page 4.

CAUTION



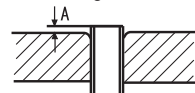
- Max. Elevation: Amax = 32.8ft / 10m (09k / 12k) = 50ft / 15m (18k / 24k)
- In case the elevation A is more than 16.4ft / 5m, oil trap should be installed every 5~7m (16.4ft-23ft)
- Max. Length: Bmax = 50ft / 15m (09k / 12k) = 83.3ft / 25m (18k / 24k)

Cutting and Flaring Work of Piping

- Pipe cutting is carried out with a pipe cutter and burrs must be removed.
- After inserting the flare nut, flaring work is carried out.

	Flare tool for R410A	Conventional flare tool	
	Clutch-type	clutch-type(Rigid-type)	Wing-nut type (Imperial-type)
A	0~0.5mm 0~1/51 inch	1.0~1.5mm 3/76 ~1/17 inch	1.5~2.0mm 1/17 ~1/8 inch

Flare tooling die



1. Cut pipe



2. Remove burrs



3. Insert the flare nut



4. Flare pipe



Correct	Incorrect				

3 Connection

- Loosen the screws on terminal block and insert the wires fully into terminal block, then tighten the screws.
- If wiring is not correct, the unit will not operate properly and it could cause a defect in the unit.
- Fix the cable with a clamp.

4 Attaching Drain-Elbow

- If the drain-elbow is used, please attach as shown in figure.
(Note: Only for heat pump unit.)

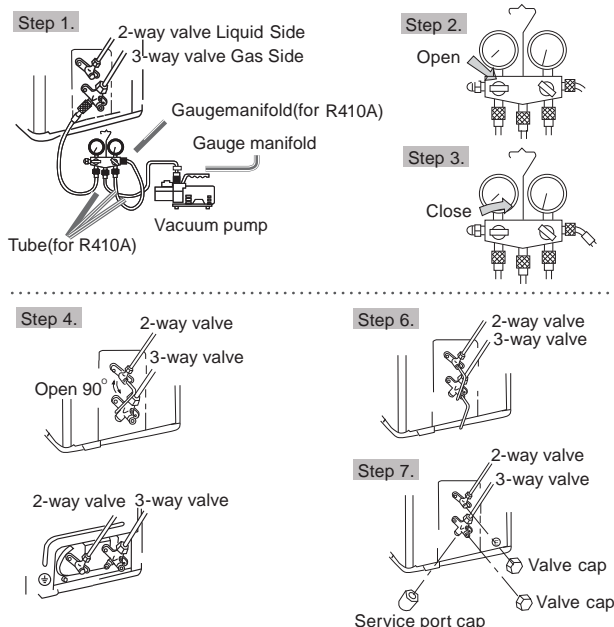


5 Purging Method: To use vacuum pump

1. Detach the service port's cap of 3-way valve, and the valve cap for 2-way valve and 3-way valve. Connect the service port to the low side of the gauge manifold and connect the vacuum pump to the center port of the manifold.
2. Open the handle on the low side of the gauge manifold and operate vacuum pump.
3. Vacuum the tubing for at least 15 minutes. The vacuum level on the low side gauge should be 29.9 in of Hg, 76 cm of Hg, 0.1 MPa. when vacuuming is complete, close the valve on the manifold and turn off the vacuum pump. The vacuum level should hold for 1-2 minutes. If the vacuum level does not hold, check the flared connections and repeat this step.
4. Open the 2-way valve 1/4 turn. After 5-6 seconds, close the valve and inspect for leaks with a leak detector or soap solution.
5. No gas leakage? Go to step 6.

In case of a leak, try tightening the flare connections to fix the leak. If the leak stops, go to step 6. If the leak continues, check the flare connections and repair as needed, then go back to step 3. then proceed step 6. If leak continues, remove the refrigerant used for the leakage check and flare tubes again. Repeat vacuum and leak and if no leakage, proceed to step 6.

6. Detach the charge hose from the service port, open 2-way valve and 3-way valve completely.
7. To prevent the gas leakage, replace the service port and valve caps.
8. After attaching the caps, check for leakage around the caps.



CAUTION

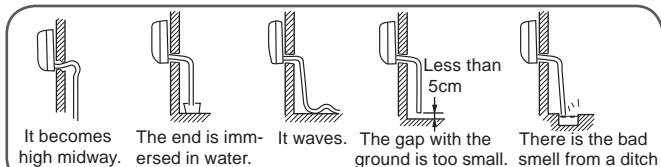
- If the refrigerant of the air conditioner leaks, it is necessary to discharge all the refrigerant. Repair the leak, vacuum the unit then charge the liquid refrigerant into air conditioner according to the amount marked on the name plate.
- Please do not let other cooling medium, except specified one (R410A), or air enter into the cooling circulation system. This could cause high pressure and could cause a leak and lead to personal injuries.

1 Power Source Installation

- The power source must be exclusively used for air conditioner.
- In the case of installing an air conditioner in a moist place, please install an earth leakage breaker.(GFCI)
- For installation in other places, use an HVACR circuit breaker of time delay fuse.

2 On Drainage

- Please install the drain hose and ensure downward flow.
- Please don't do the drainage as shown below.



- Please pour water in the drain pan of the indoor unit, and confirm that drainage is proper.
- In case that the attached drain hose is in a room, please apply insulation to the hose to prevent condensation.

Refrigerant charge label

Contains fluorinated greenhouse gases covered by the Kyoto Protocol		A
R410A		
1 =	kg	B
2 =	kg	C
1+2 =	kg	D
F	E	

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. Do not vent into the atmosphere.
Refrigerant type: R410A

GWP* value: 1975

GWP=global warming potential

Please fill in with indelible ink,

- 1 the factory refrigerant charge of the product
- 2 the additional refrigerant amount charged in the field and
- 1+2 the total refrigerant charge

on the refrigerant charge label supplied with the product.
The filled out label must be adhered in the proximity of the product charging port (e.g. onto the inside of the stop value cover).

A contains fluorinated greenhouse gases covered by the Kyoto Protocol

B factory refrigerant charge of the product: see unit name plate

C additional refrigerant amount charged in the field

D total refrigerant charge

E outdoor unit

F refrigerant cylinder and manifold for charging

Check for Installation and Test Run

- Please kindly explain to our customers how to operate through the instruction manual.

Check Items for Test Run

□ Put check mark ✓ in boxes

- ☐ Gas leak from interconnecting tubing?
- ☐ Installation is on the interconnecting tubing?
- ☐ Are the connecting wirings of indoor and outdoor firmly inserted to the terminal block?
- ☐ Is the connecting wiring of indoor and outdoor firmly fixed?
- ☐ Is drainage securely carried out?
- ☐ Is the ground wire securely connected?
- ☐ Is the indoor unit securely fixed?
- ☐ Is power source voltage the local codes?
- ☐ Is there any noise?
- ☐ Are the lights near the unit working normally?
- ☐ Are cooling and heating (when in heat pump) performing normally?
- ☐ Is the operation of room temperature control normal?

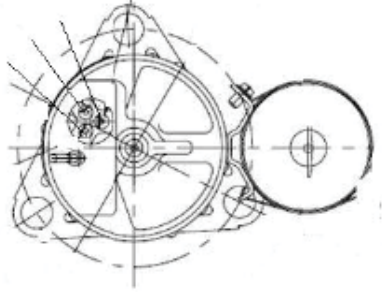
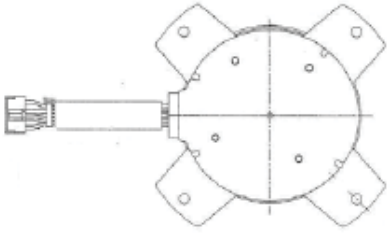
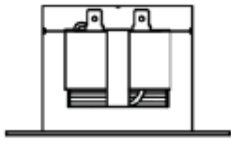
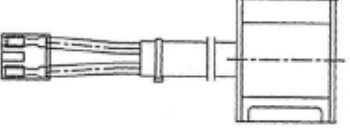
11 Service Diagnosis

11.1 Caution for Diagnosis

The operation lamp flashes when any of the following errors is detected.

1. When a protection device of the indoor or outdoor unit is activated or when the thermistor malfunctions, disabling equipment operation.
2. When a signal transmission error occurs between the indoor and outdoor units. In either case, conduct the diagnostic procedure described in the following pages.

11.2 Parameter of primary electronic appliance

name	parameter	picture
Compressor	Rated voltage:220-230V Rated current:4.8A Rated frequency: 50/60HZ	
Fan motor	Rated voltage:220-230V Rated current:0.2A Rated frequency: 50/60HZ	
Reactor	Rated voltage:220-230V Rated current:10.5A Rated frequency: 50/60HZ	
4-way valve	Rated voltage:220-230V Rated current:0.1A Rated frequency: 50/60HZ	

11.3 Problem Symptoms and Measures

Symptom	Check Item	Details of Measure
None of the units operates	Check the power supply.	Check to make sure that the rated voltage is supplied.
	Check the indoor PCB	Check to make sure that the indoor PCB is broken
Operation sometimes stops.	Check the power supply.	A power failure of 2 to 10 cycles can stop air conditioner operation.
Equipment operates but does not cool, or does not heat (only for heat pump)	Check for faulty operation of the electronic expansion valve.	Set the units to cooling operation, and compare the temperatures of the liquid side connection pipes of the connection section among rooms to check the opening and closing operation of the electronic expansion valves of the individual units.
	Diagnosis by service port pressure and operating current.	Check for insufficient gas.
Large operating noise and vibrations	Check the installation condition.	Check to make sure that the required spaces for installation (specified in the Technical Guide, etc.) are provided.

11.4 Error codes and description

	Code indication		fault description	Reference Page
	Indoor displaying panel code indication	Outdoor (LED1 flash times)		
Indoor and Outdoor	E7	15	Communication fault between indoor and outdoor units	Page48
Indoor Malfunction	E1	--	Room temperature sensor failure	Page38
	E2	--	Heat-exchange sensor failure	Page38
	E4	--	Indoor EEPROM error	Page47
	E14	--	Indoor fan motor malfunction	Page39
Outdoor Malfunction	F12	1	Outdoor EEPROM error	Page47
	F1	2	The protection of IPM	Page43
	F22	3	Overcurrent protection of AC electricity for the outdoor model	Page52
	F3	4	Communication fault between the IPM and outdoor PCB	Page45
	F19	6	Power voltage is too high or low	Page50
	F27	7	Compressor is lock-rotor or stopped momentary	Page51
	F4	8	Overheat protection for Discharge temperature	Page46
	F8	9	Outdoor DC fan motor fault	Page42
	F21	10	Defrost temperature sensor failure	Page38
	F7	11	Suction temperature sensor failure	Page38
	F6	12	Ambient temperature sensor failure	Page38
	F25	13	Discharge temperature sensor failure	Page38
	F13	16	Short of refrigerant	Page54
	F11	18	deviate from the normal for the compressor	Page51
	F28	19	Loop of the station detect error	Page51
	/	21	Over load protection of indoor system	Page53
	F2	24	Overcurrent of the compressor	Page52
	F23	25	Overcurrent protection for single-phase of the compressor	Page52
	E9	21	High work-intense protection	Page54

11.4.1 Thermistor or Related Abnormality

Indoor display	E1: Room temperature sensor failure
	E2: Heat-exchange sensor failure
Outdoor display	LED1 flash 10 times: Defrost temperature sensor failure
	LED1 flash 11 times: Suction temperature sensor failure
	LED1 flash 12 times: Ambient temperature sensor failure
	LED1 flash 13 times: Discharge temperature sensor failure

Method of malfunction detection

The temperatures detected by the thermistors are used to determine thermistor errors

Malfunction detection conditions

when the thermistor input is more than 4.92V or less than 0.08V during compressor operation.

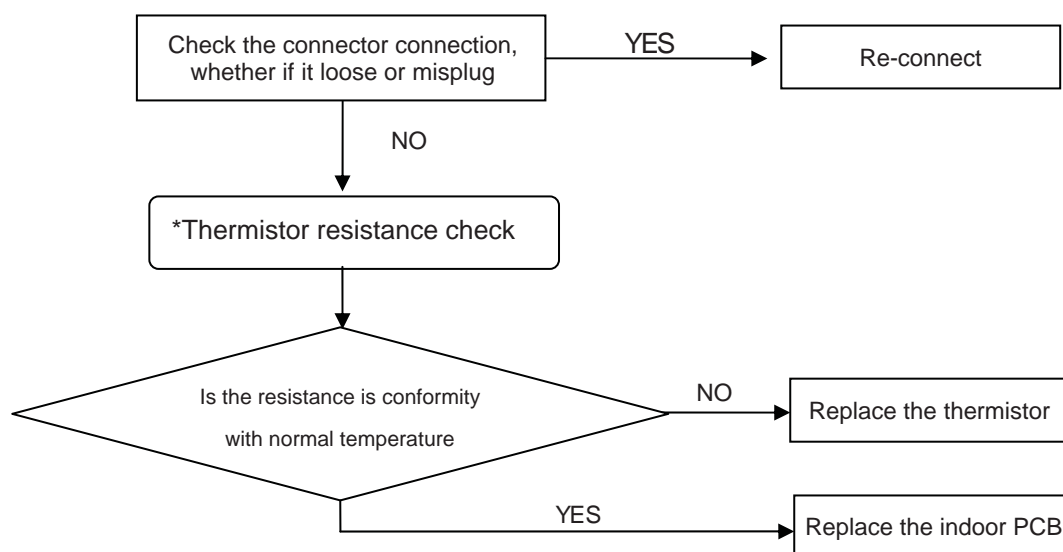
- Note: The values vary slightly in some models

Supposed causes

- Faulty connector connection
- Faulty thermistor
- Faulty PCB

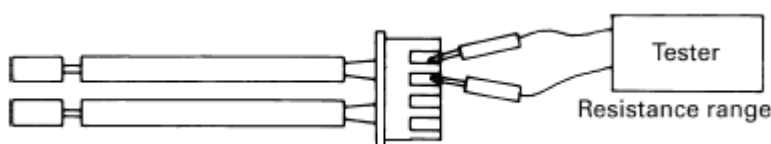
Troubleshooting

* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



Thermistor resistance check method:

Remove the connector of the thermistor on the PCB, and measure the resistance of thermistor using tester. The relationship between normal temperature and resistance is shown in the value of indoor thermistor.



11.4.2 EEPROM abnormal

Indoor Display

outdoor display

E4: indoor EEPROM error

F12: Outdoor EEPROM error; Outdoor LED1 flash 1 times

Method of malfunction detection	The Data detected by the EEPROM are used to determine MCU
Malfunction detection conditions	when the data of EEPROM is error or the EEPROM is damaged
Supposed causes	<div>■Faulty EEPROM data</div> <div>■Faulty EEPROM</div> <div>■Faulty PCB</div>
Troubleshooting	<div>* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.</div>

Replace the indoor or outdoor mainboard

11.4.3 Indoor AC fan motor malfunction

Indoor Display

E14

Method of
malfunction detection

The fan speed detected by the Hall IC during fan motor running which is used to determine the fan motor operating

Malfunction detection
conditions

When there is no fan speed feedback signal within 2 minutes

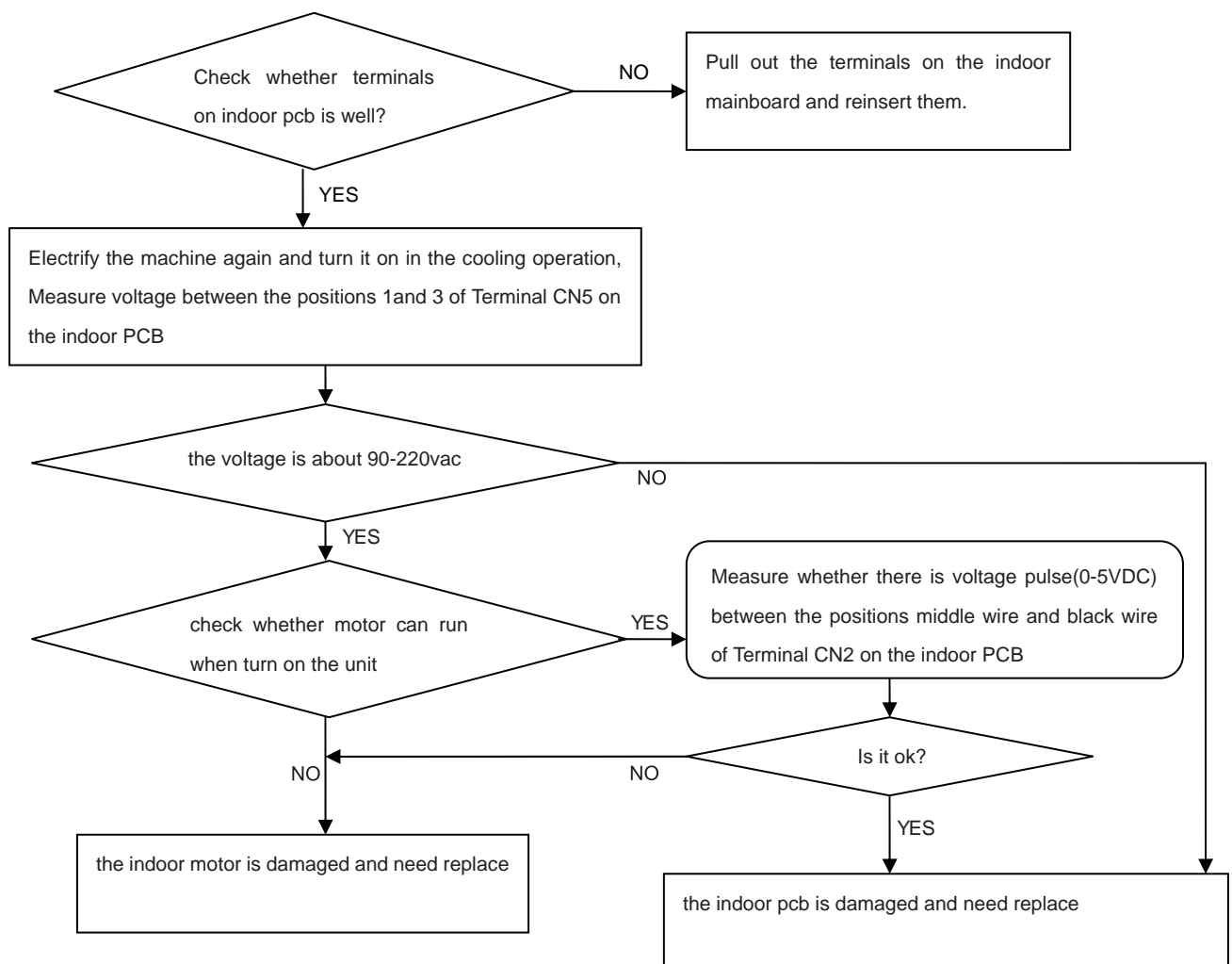
Supposed causes

- Operation halt due to breaking of wire inside the fan motor.
- Fan motor overheat protection
- Operation halt due to breaking of the fan motor lead wires
- Detection error due to faulty indoor unit PCB

Troubleshooting

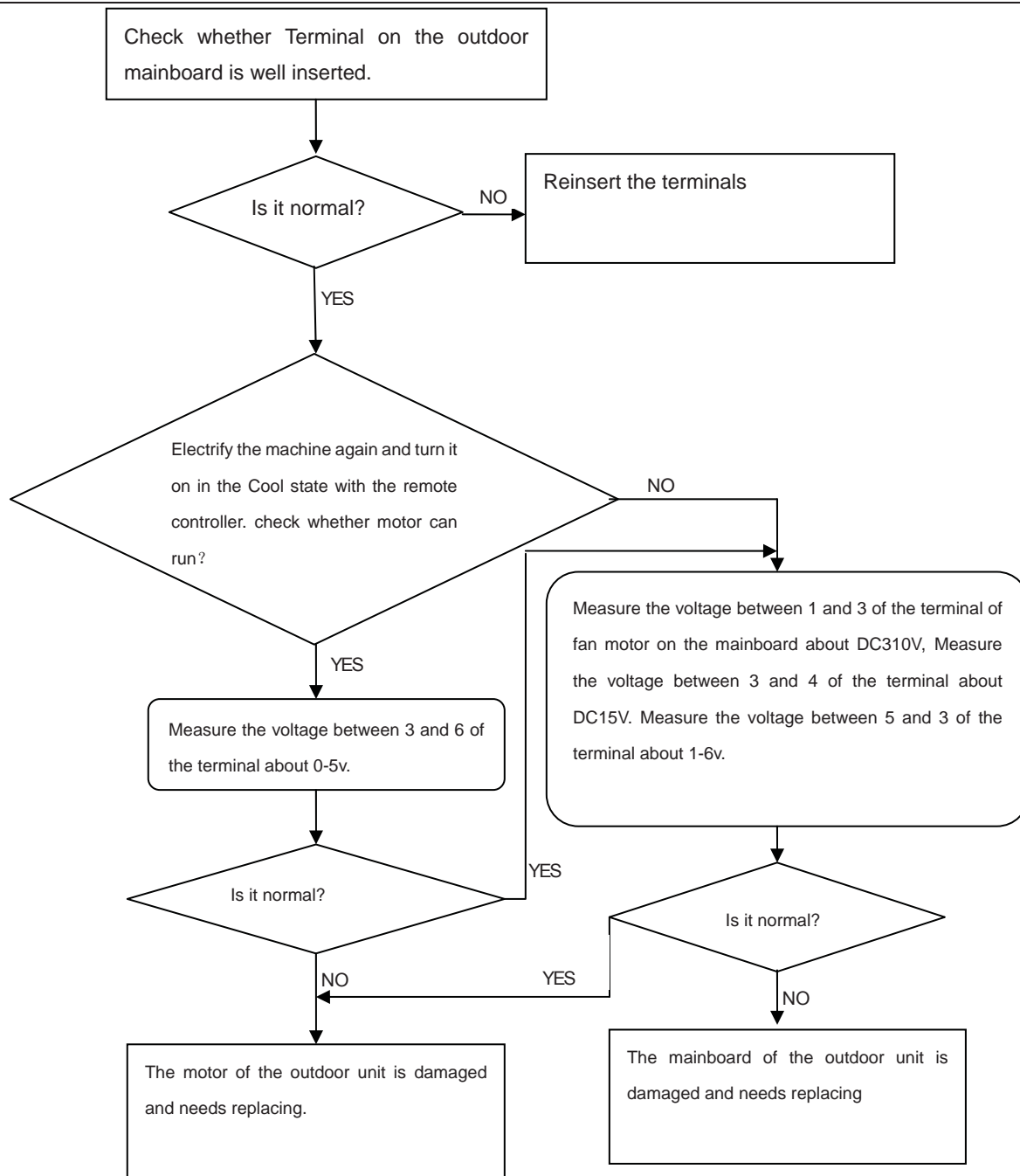
*** Caution**

Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be caused



11.4.4 Outdoor DC fan motor fault

Outdoor display	LED1 flash 9 times
Method of malfunction detection	DC fan motor is detected by checking the fan running condition and so on
Malfunction detection conditions	when the data of EEPROM is error or the EEPROM is damaged
Supposed causes	<ul style="list-style-type: none">■DC fan motor protection dues to the DC fan motor faulty■DC fan motor protection dues to faulty PCB
Troubleshooting	<p>* Caution</p> <p>Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.</p>



11.4.5 IPM protection

Outdoor display

LED1 flash 2 times

Method of
malfunction detection

IPM protection is detected by checking the compressor running condition and so on

Malfunction detection
conditions

- The system leads to IPM protection due to over current
- The compressor faulty leads to IPM protection
- circuit component of IPM is broken and led to IPM protection

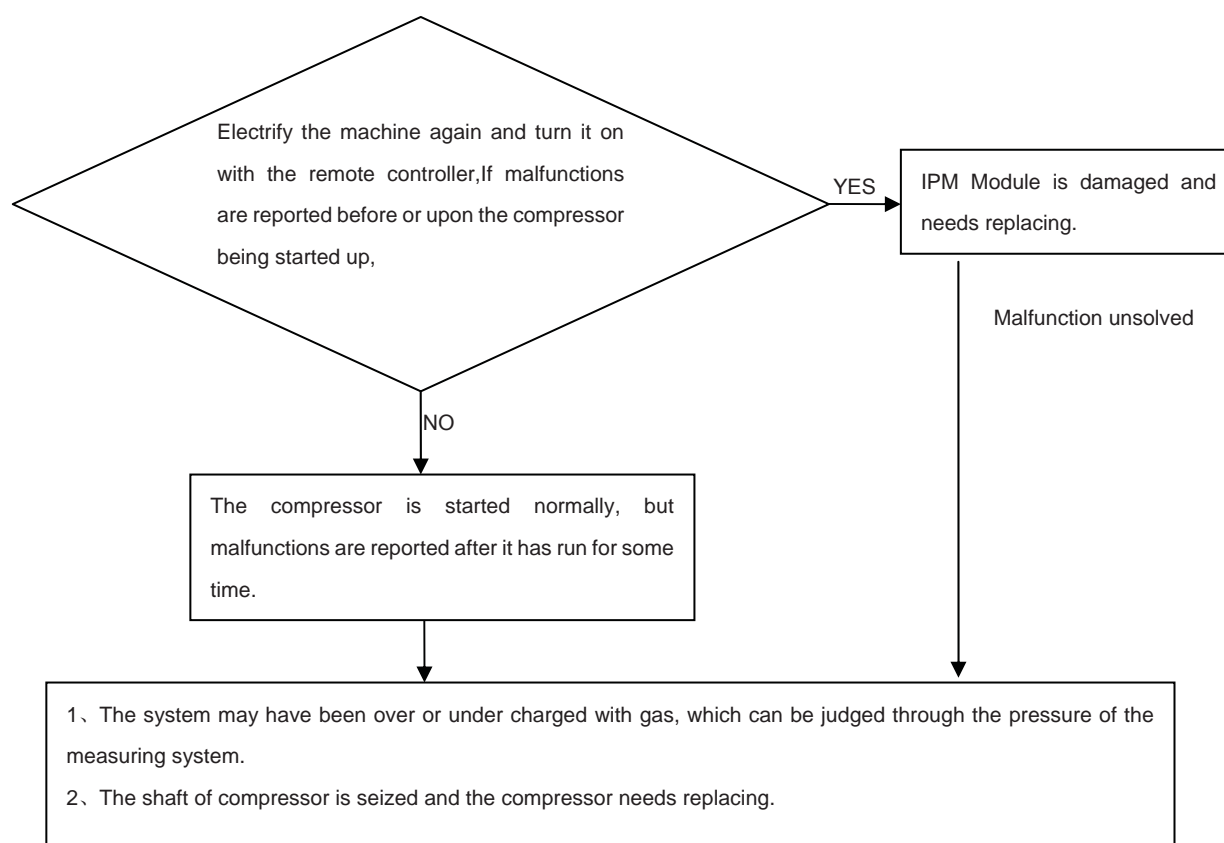
Supposed causes

- IPM protection dues to the compressor faulty
- IPM protection dues to faulty PCB of IPM module
- Compressor wiring disconnected

Troubleshooting

*** Caution**

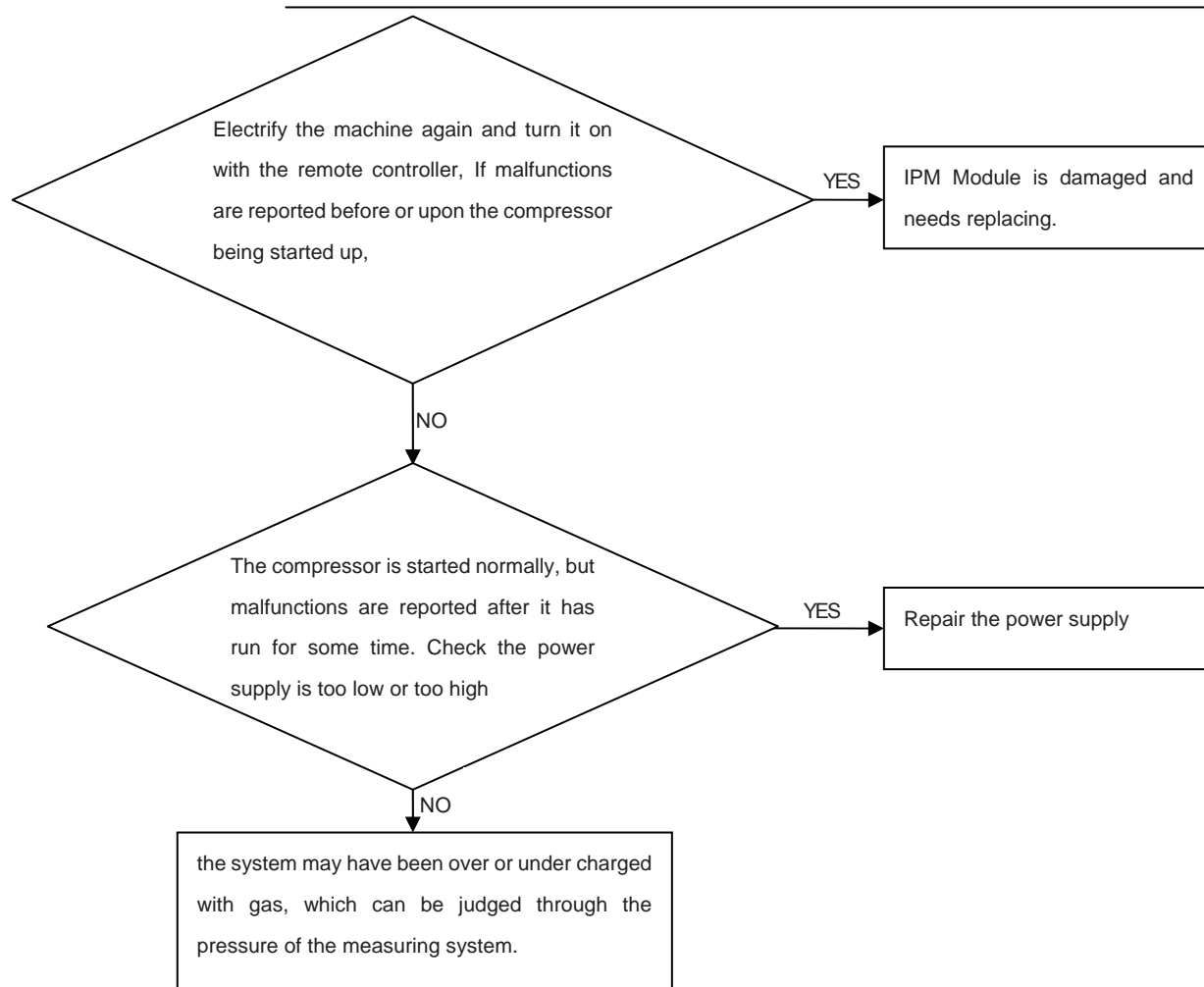
Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred..



11.4.6 Over-current of the compressor

Outdoor display LED1 flash 3 or 24 or 25 times

Method of malfunction detection	the current of the compressor is too high
Malfunction detection conditions	when the IPM Module is damaged or the compressor is damaged. power supply voltage is too low or too high
Supposed causes	<ul style="list-style-type: none"> ■ Faulty IPM Module ■ Faulty compressor ■ Faulty power supply
Troubleshooting	<p>* Caution</p> <p>Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred...</p>

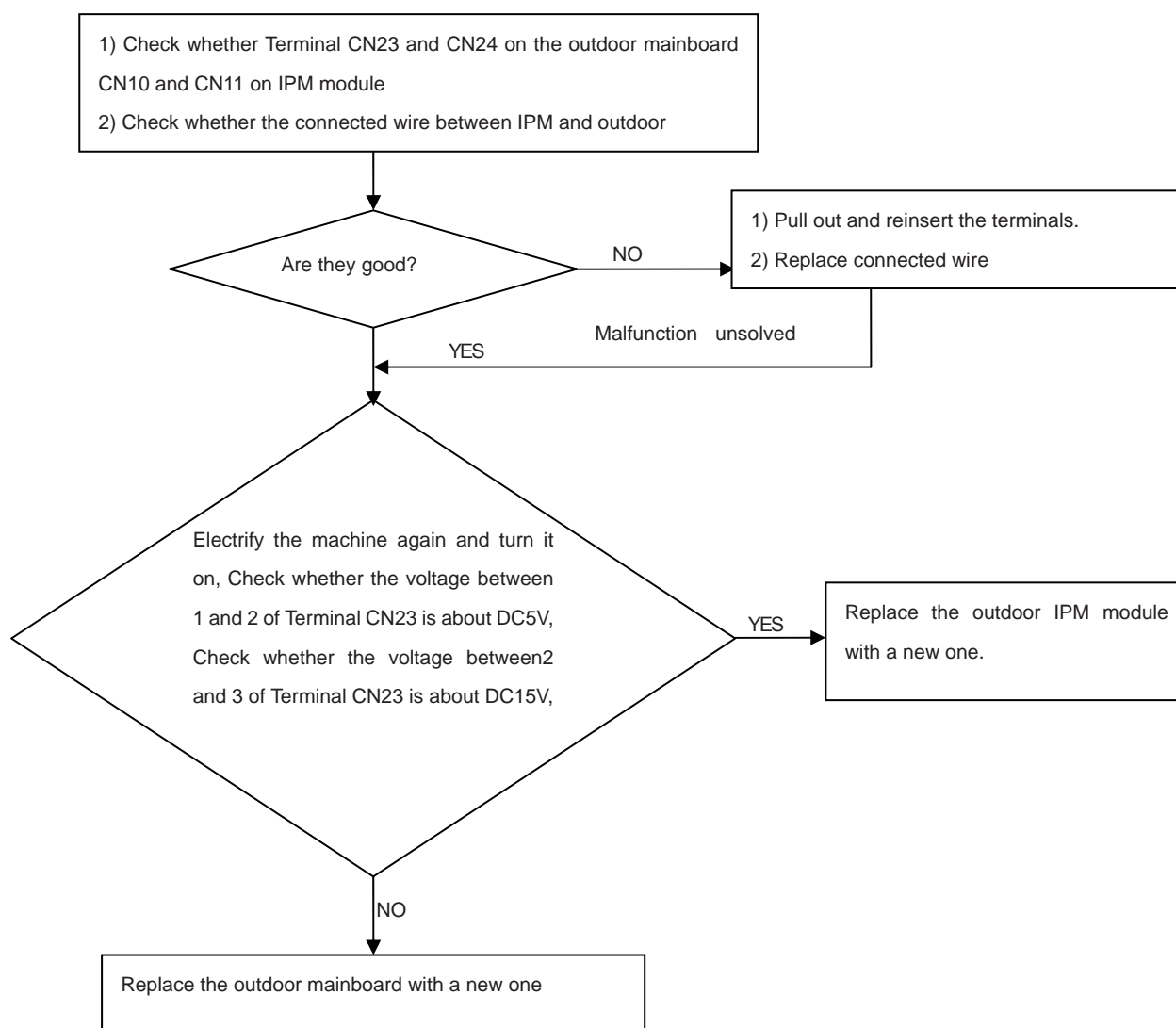


11.4.7 The communication fault between IPM and outdoor PCB

Outdoor display

LED1 flash 4 times

Method of malfunction detection	Communication is detected by checking the IPM module and the outdoor PCB
Malfunction detection conditions	<ul style="list-style-type: none"> ■The outdoor PCB broken leads to communication fault ■The IPM module broken leads to communication fault
Supposed causes	<ul style="list-style-type: none"> ■The outdoor PCB is broken ■The IPM module is broken ■Communication wiring disconnected
Troubleshooting	<p>* Caution</p> <p>Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred</p>



11.4.8 Power Supply Over or under voltage fault

Outdoor display

LED1 flash 21 times The power supply is over voltage

Method of
malfunction detection

An abnormal voltage rise or fall is detected by checking the specified voltage detection

Malfunction detection
conditions

An voltage signal is fed from the voltage detection circuit to the microcomputer

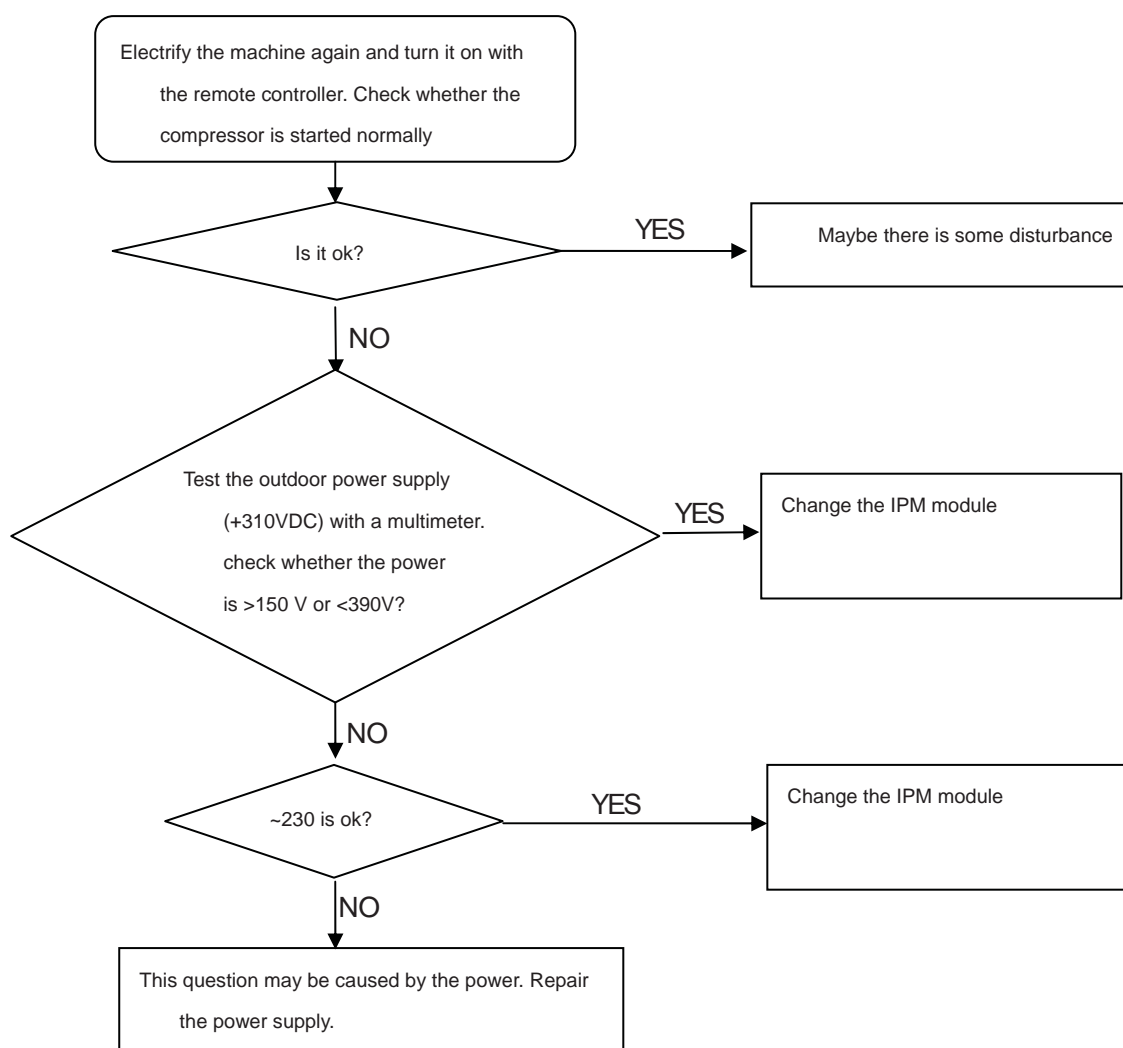
Supposed causes

- Supply voltage not as specified.
- The IPM module is broken.
- The outdoor PCB is broken.

Troubleshooting

*** Caution**

Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



11.4.9 Overheat Protection For Discharge Temperature

Outdoor display

LED1 flash 8 times

Method of
malfunction detection

The Discharge temperature control is checked with the temperature being detected by the Discharge pipe thermistor

Malfunction detection
conditions

when the compressor discharge temperature is above 230°F

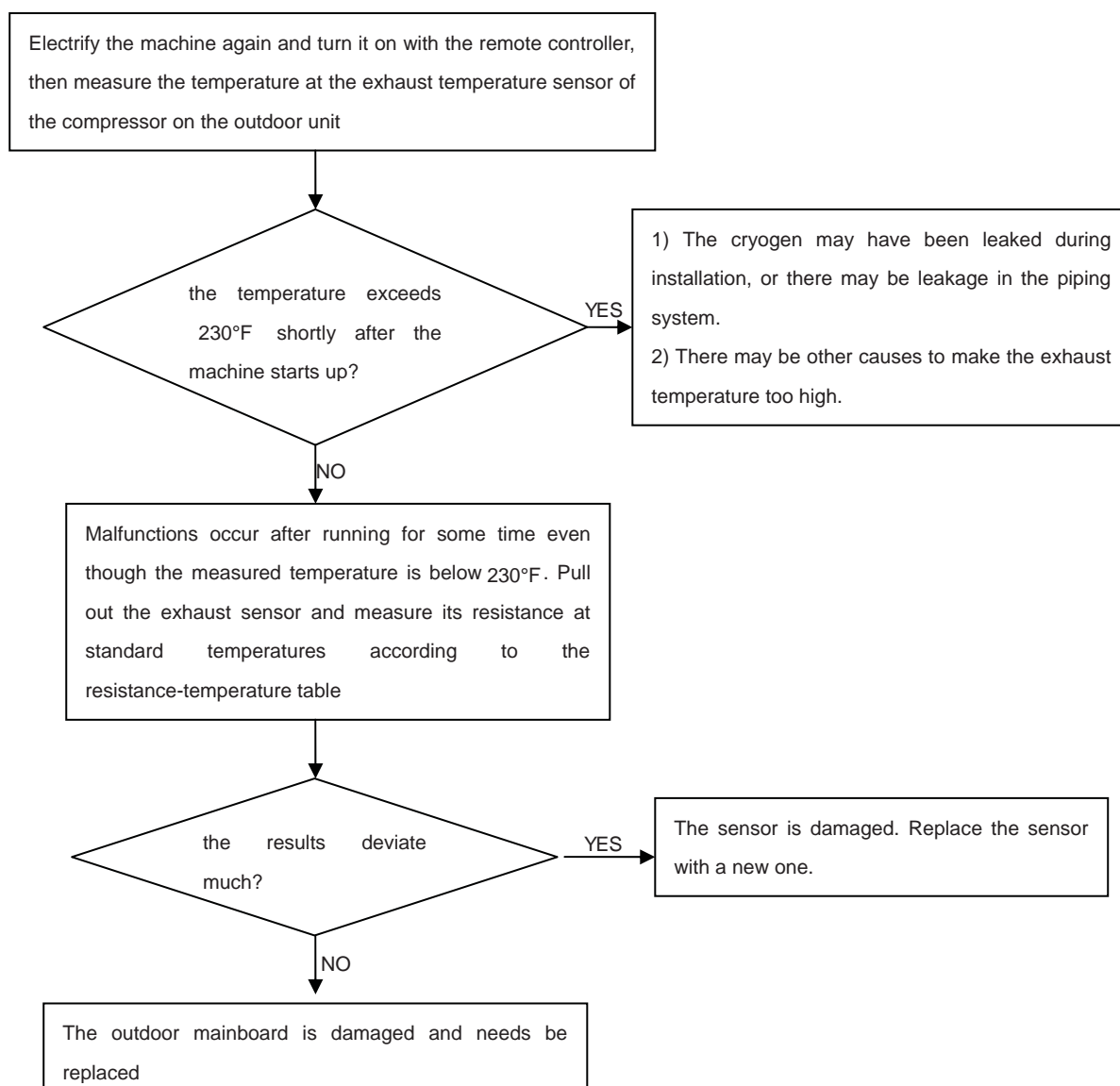
Supposed causes

- Electronic expansion valve defective
- Faulty thermistor
- Faulty PCB

Troubleshooting

*** Caution**

Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



11.4.10 The communication fault between indoor and outdoor

indoor display
Outdoor display

E7
LED1 flash 15 times

Method of
malfunction detection

Communication is detected by checking the indoor PCB and the outdoor PCB

Malfunction detection
conditions

- The outdoor PCB broken leads to communication fault
- The indoor PCB broken leads to communication fault

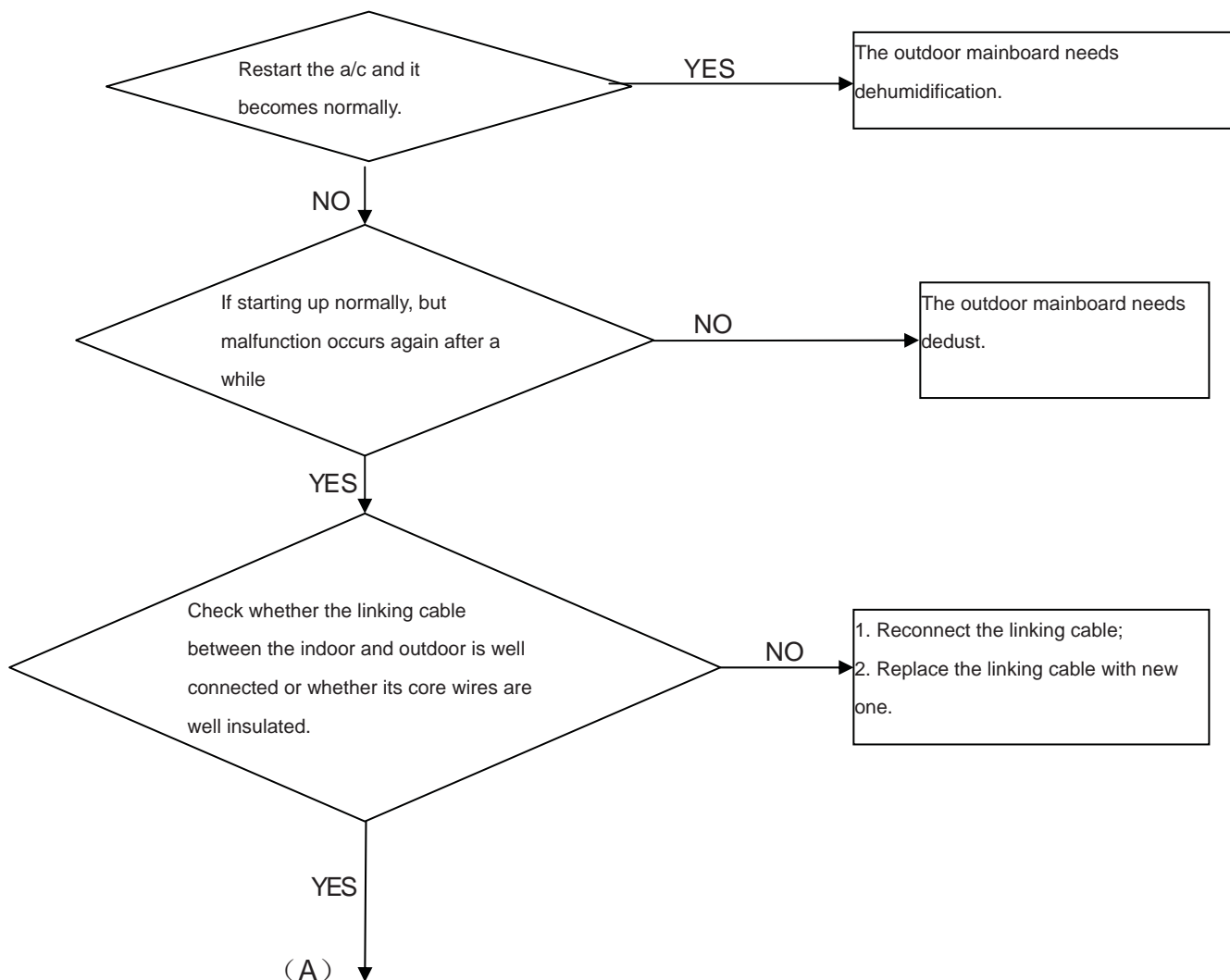
Supposed causes

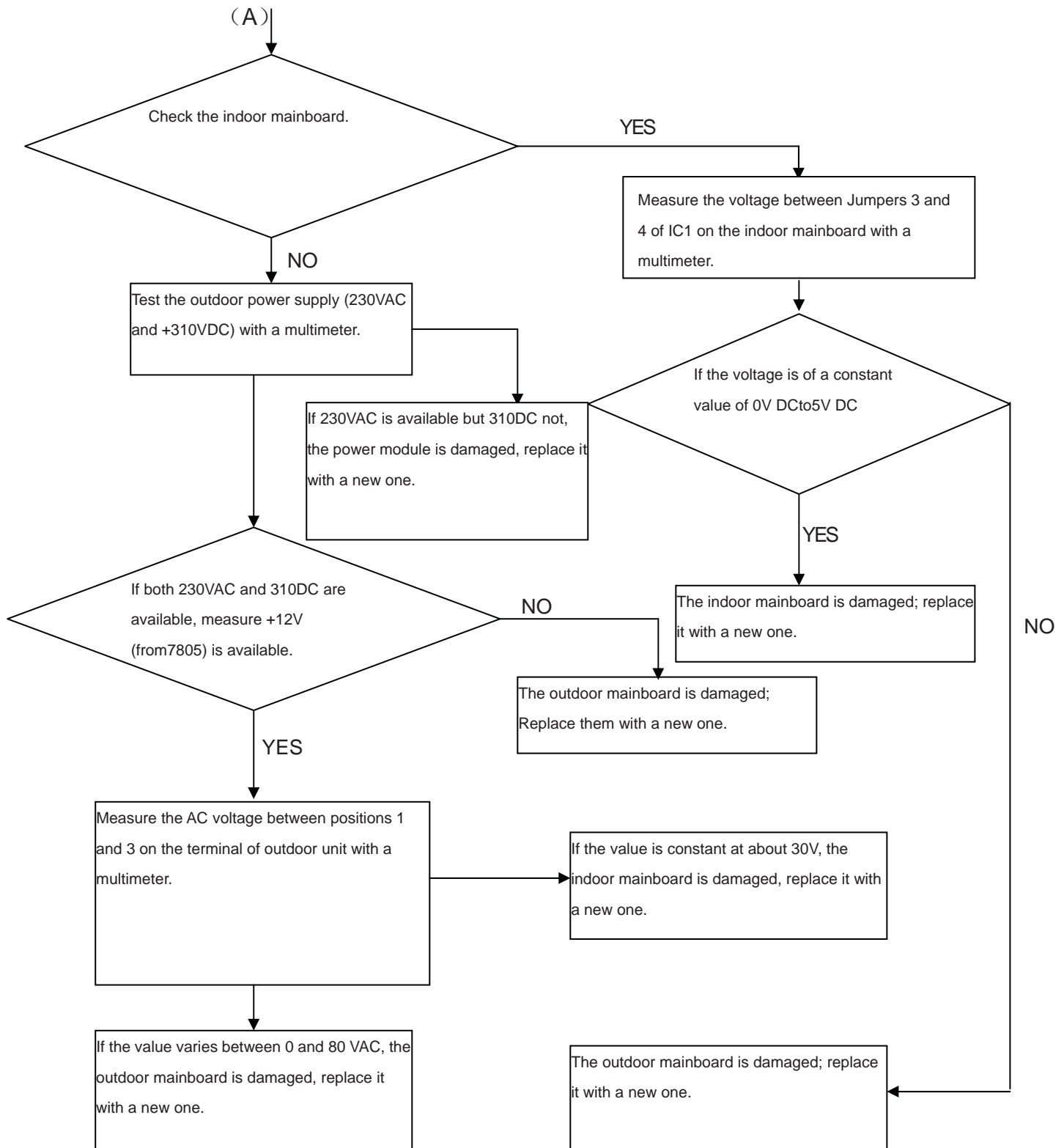
- Communication wiring disconnected
- The indoor PCB is broken
- The outdoor PCB is broken
- The module PCB is broken

Troubleshooting

*** Caution**

Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.

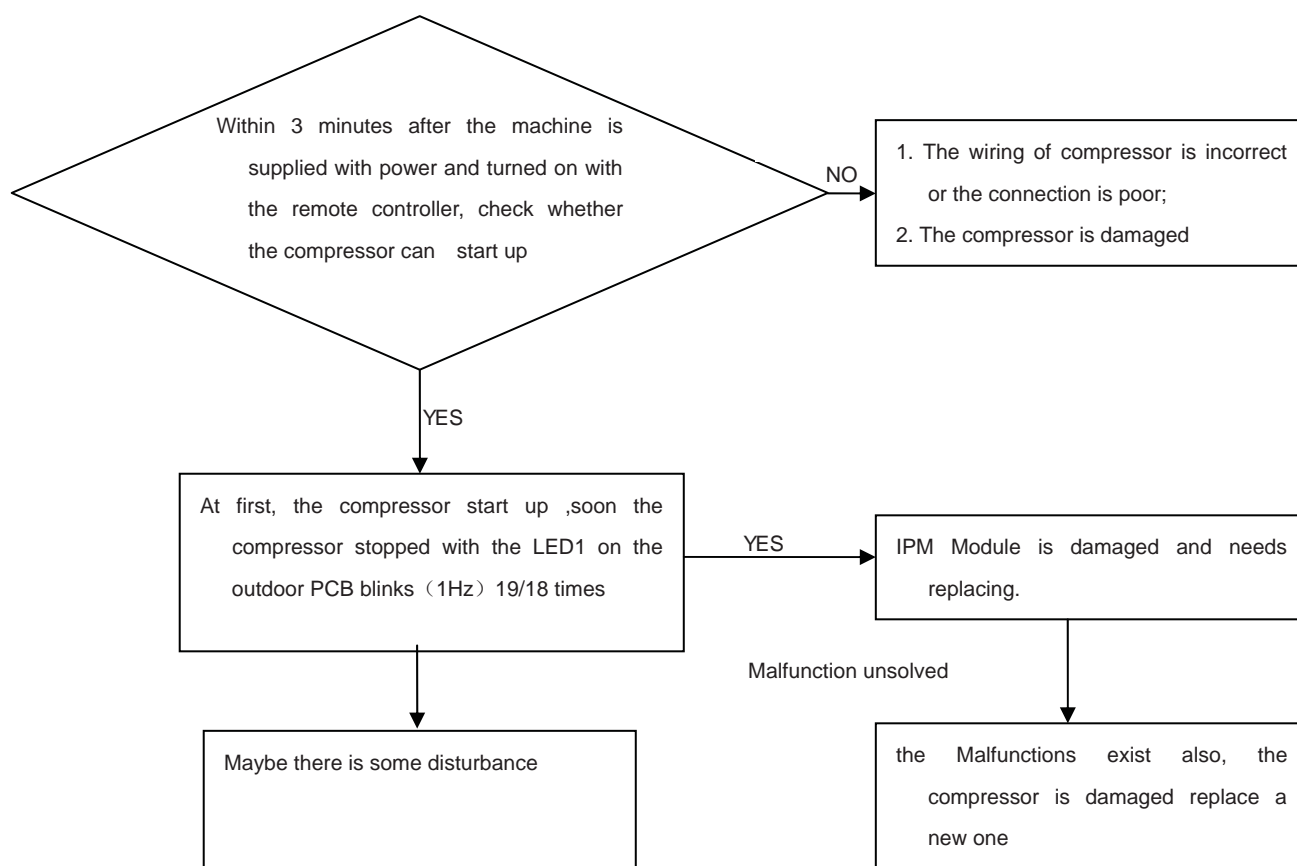




11.4.11 Loss of synchronism detection

Inverter side current detection is abnormal

Outdoor display	LED1 flash 18 times LED1 flash 19 times
Method of malfunction detection	The position of the compressor rotor can not detected normally
Malfunction detection conditions	when the wiring of compressor is wrong or the connection is poor; or the compressor is damaged
Supposed causes	<ul style="list-style-type: none"> ■Faulty The wiring of compressor ■Faulty compressor ■Faulty PCB
Troubleshooting	<p>* Caution</p> <p>Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.</p>

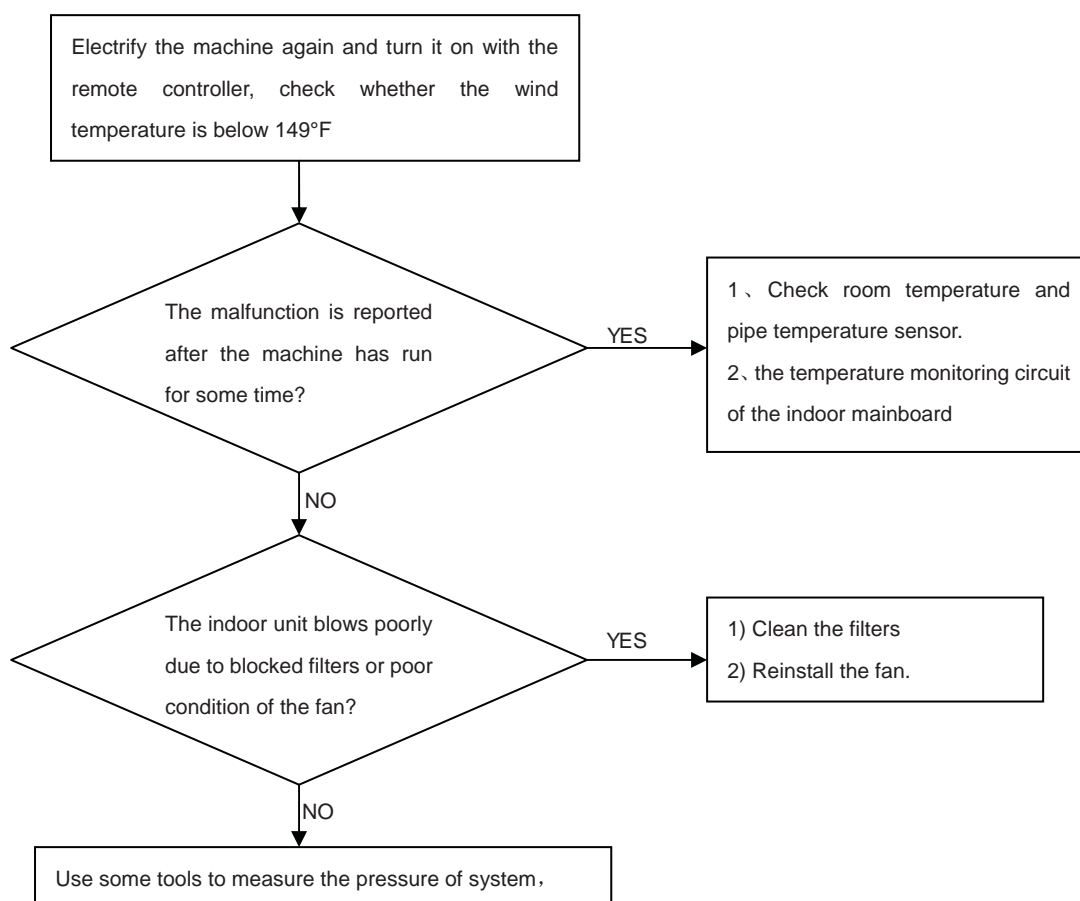


11.4.12 High work-intense protection

Outdoor display

LED1 flash 21 times

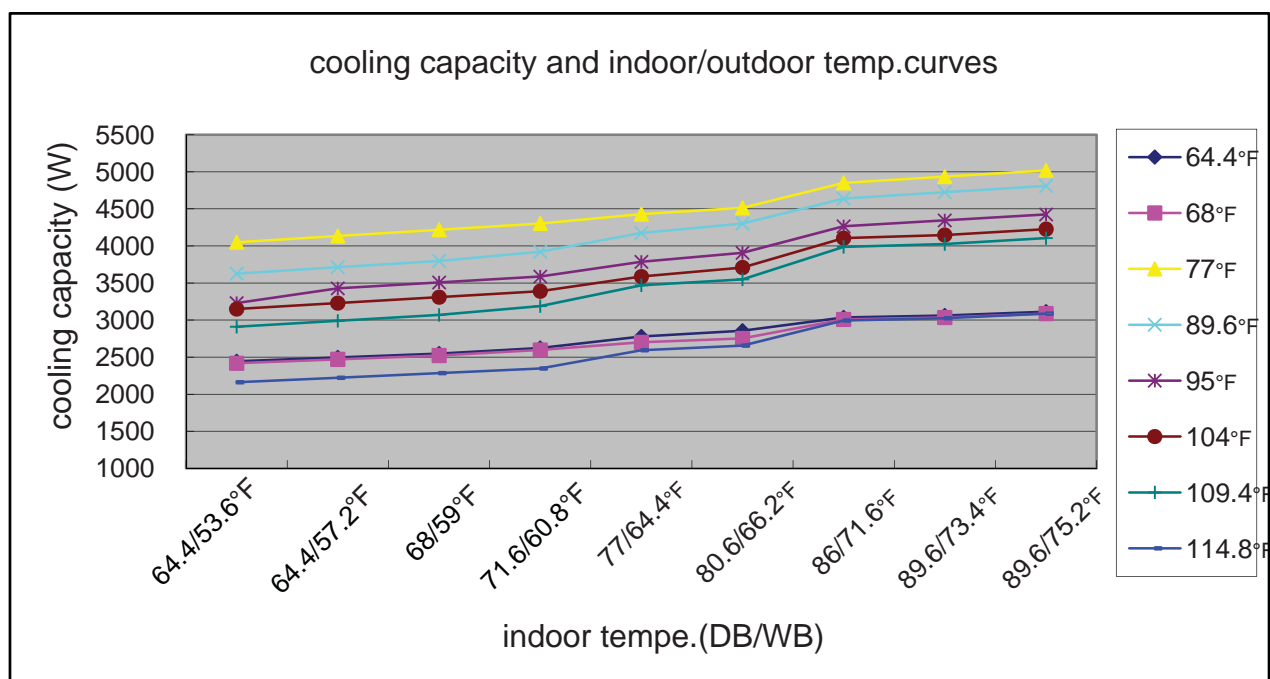
Method of malfunction detection	High work-intense control is activated in the heating mode if the temperature being sensed by the heat exchanger thermistor exceeds the limit.
Malfunction detection conditions	Activated when the temperature being sensed by the heat exchanger rises above 149°F twice in 30 minutes.
Supposed causes	<ul style="list-style-type: none"> ■ Faulty electronic expansion valve ■ Dirty heat exchanger ■ Faulty heat-exchange sensor ■ Insufficient gas
Troubleshooting	<p>* Caution</p> <p>Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.</p>



12. Performance and curves diagrams

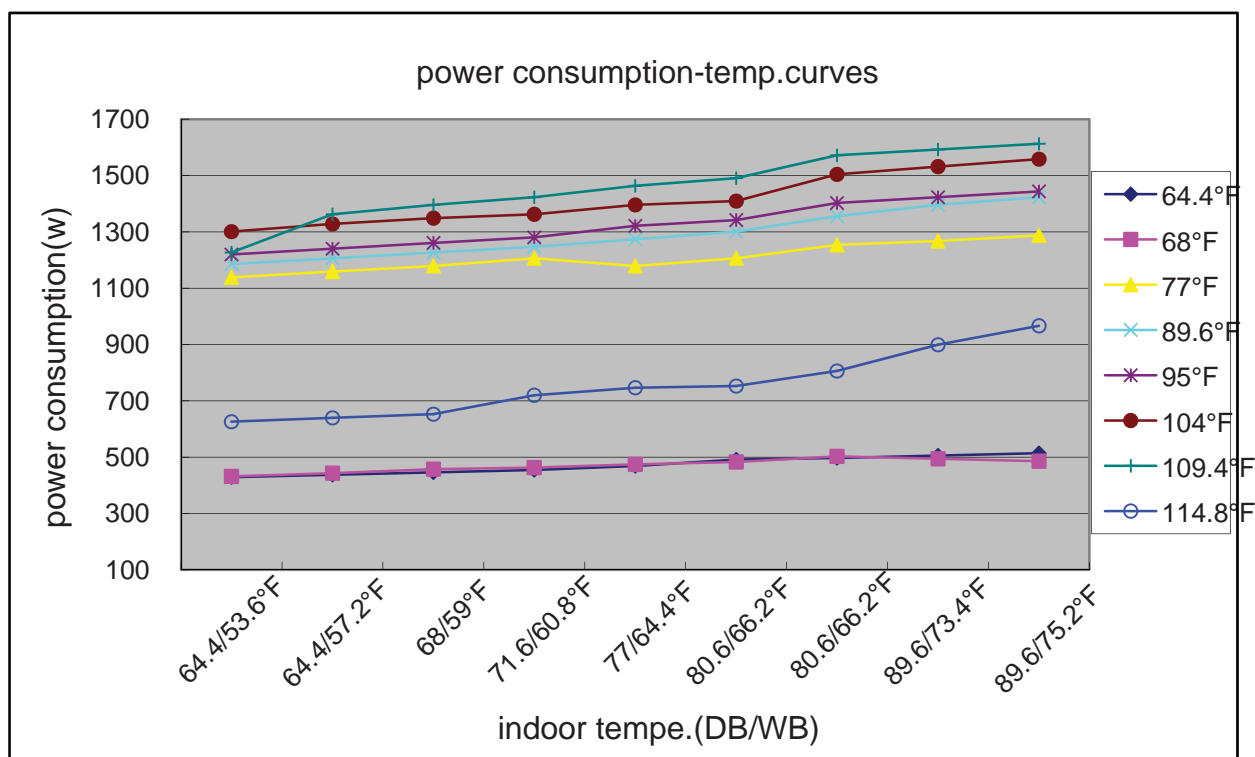
12.1 Cooling capacity-temperature curves

Cooling value-temperature table								
indoor temp.	outdoor temp.(humidity 46%)							
DB/WB	64.4°F	68°F	77°F	89.6°F	95°F	104°F	109.4°F	114.8°F
64.4/53.6°F	2443	2417	4048	3627	3228	3149	2910	2160
64.4/57.2°F	2494	2469	4133	3711	3428	3228	2989	2222
68/59°F	2546	2520	4217	3795	3507	3308	3069	2283
71.6/60.8°F	2623	2597	4301	3922	3587	3388	3189	2345
77/64.4°F	2777	2700	4428	4175	3786	3587	3468	2592
80.6/66.2°F	2854	2751	4512	4301	3906	3707	3547	2654
86/71.6°F	3034	3009	4850	4639	4265	4105	3986	2993
89.6/73.4°F	3060	3034	4934	4723	4344	4145	4026	3024
89.6/75.2°F	3111	3086	5018	4808	4424	4225	4105	3086



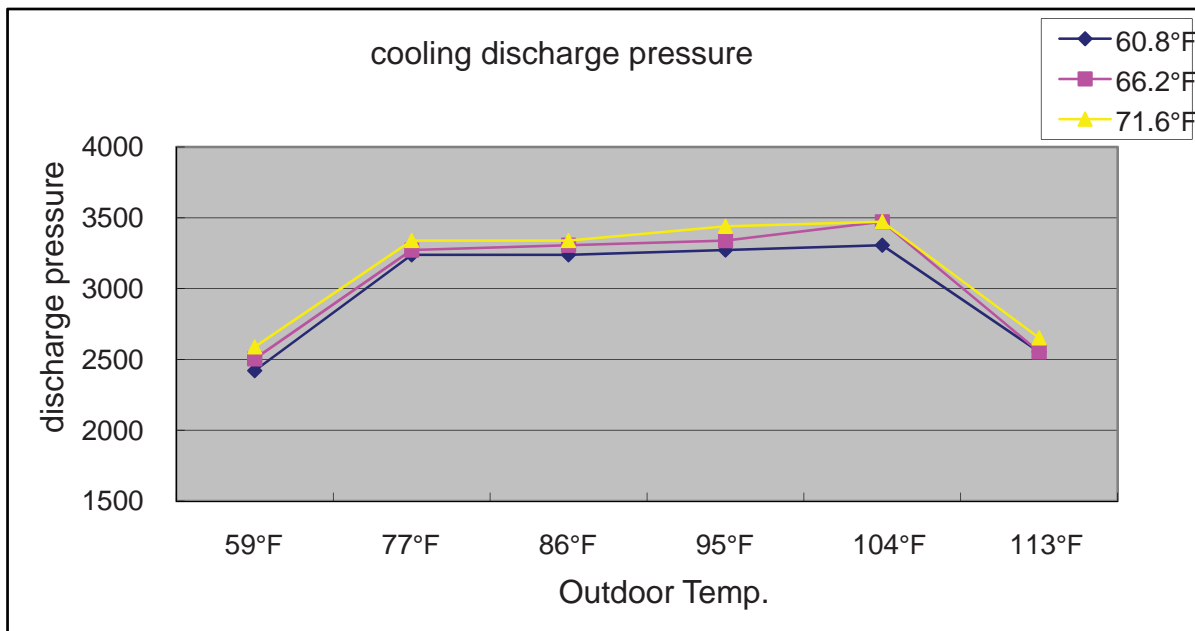
12.2 Cooling power consumption value- temperature curves

Power consumption value-temp.table								
indoor temp.	outdoor temp.(humidity 46%)							
DB/WB	64.4°F	68°F	77°F	89.6°F	95°F	104°F	109.4°F	114.8°F
64.4/53.6°F	429	432	1138	1186	1220	1301	1227	626
64.4/57.2°F	437	443	1159	1206	1240	1328	1362	640
68/59°F	446	457	1179	1227	1260	1349	1396	653
71.6/60.8°F	454	463	1206	1247	1281	1362	1423	720
77/64.4°F	468	474	1179	1274	1321	1396	1464	746
80.6/66.2°F	491	483	1206	1301	1342	1409	1491	753
86/71.6°F	497	503	1254	1355	1403	1504	1572	806
89.6/73.4°F	505	494	1267	1396	1423	1531	1592	899
89.6/75.2°F	514	486	1288	1423	1443	1559	1613	966



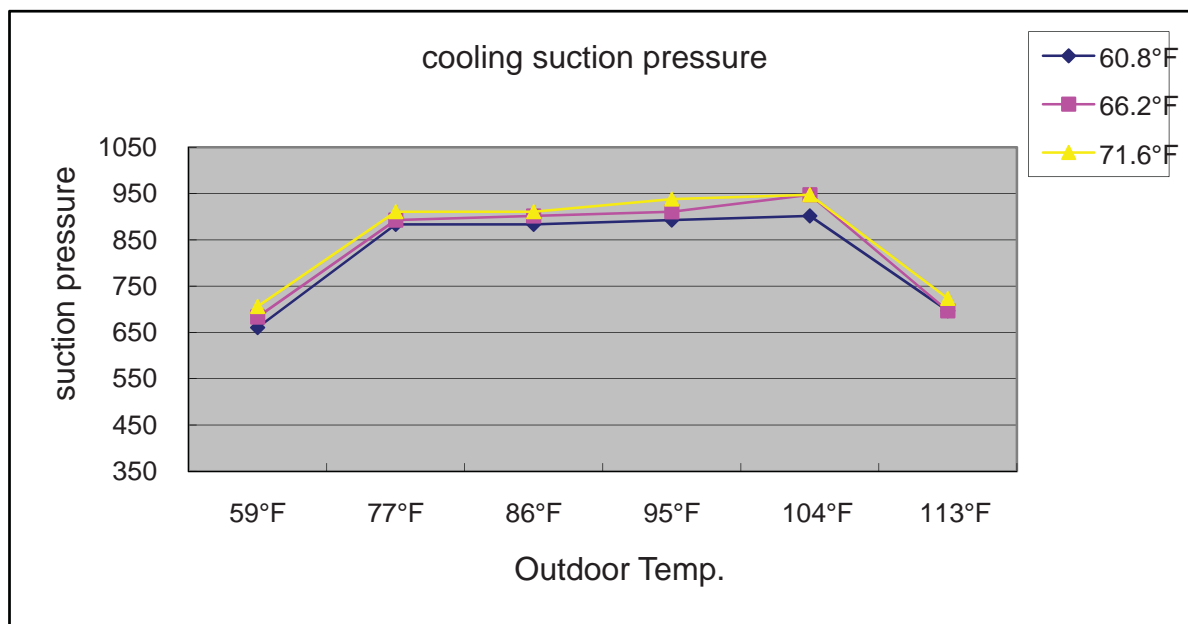
12.3 Cooling discharge pressure curves

Cooling discharge pressure. table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	60.8°F	66.2°F	71.6°F
59°F	2421	2504	2588
77°F	3239	3273	3339
86°F	3239	3306	3339
95°F	3273	3339	3439
104°F	3306	3473	3473
113°F	2554	2554	2652



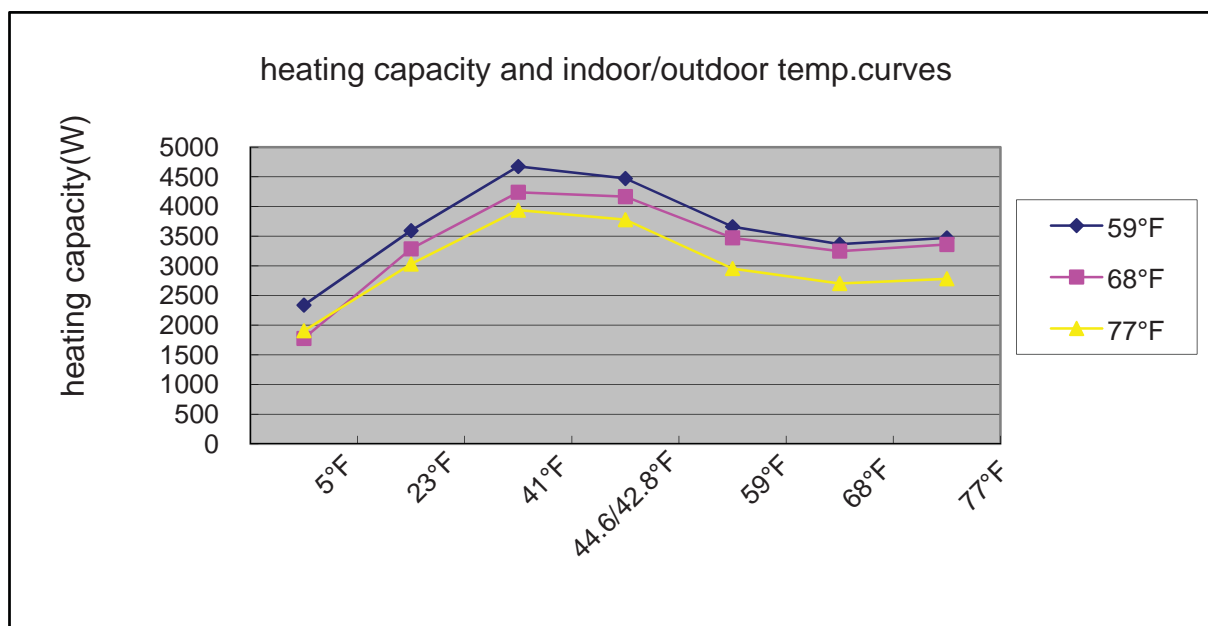
12.4 Cooling suction pressure curves

Cooling suction pressure. table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	60.8°F	66.2°F	71.6°F
59°F	660	683	706
77°F	883	893	911
86°F	883	902	911
95°F	893	911	938
104°F	902	947	947
113°F	696	696	723



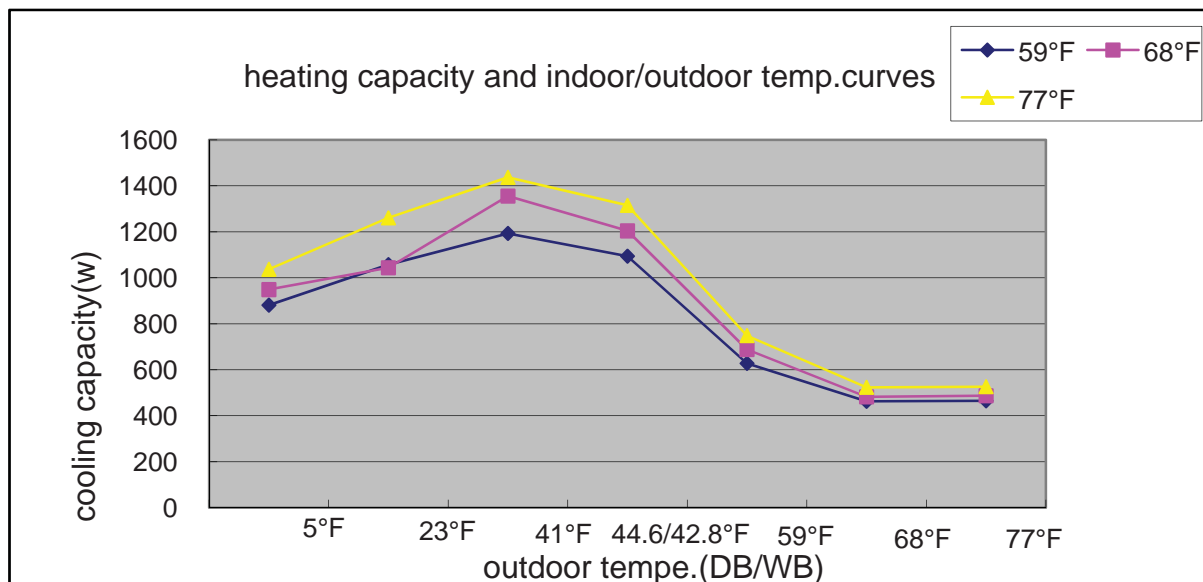
12.5 Heating capacity-temperature curves

Heating capacity and indoor/outdoor temp. table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	59°F	68°F	77°F
5°F	2338	1776	1905
23°F	3594	3286	3031
41°F	4676	4240	3940
44.6/42.8°F	4473	4167	3779
59°F	3660	3472	2955
68°F	3366	3248	2703
77°F	3472	3360	2783



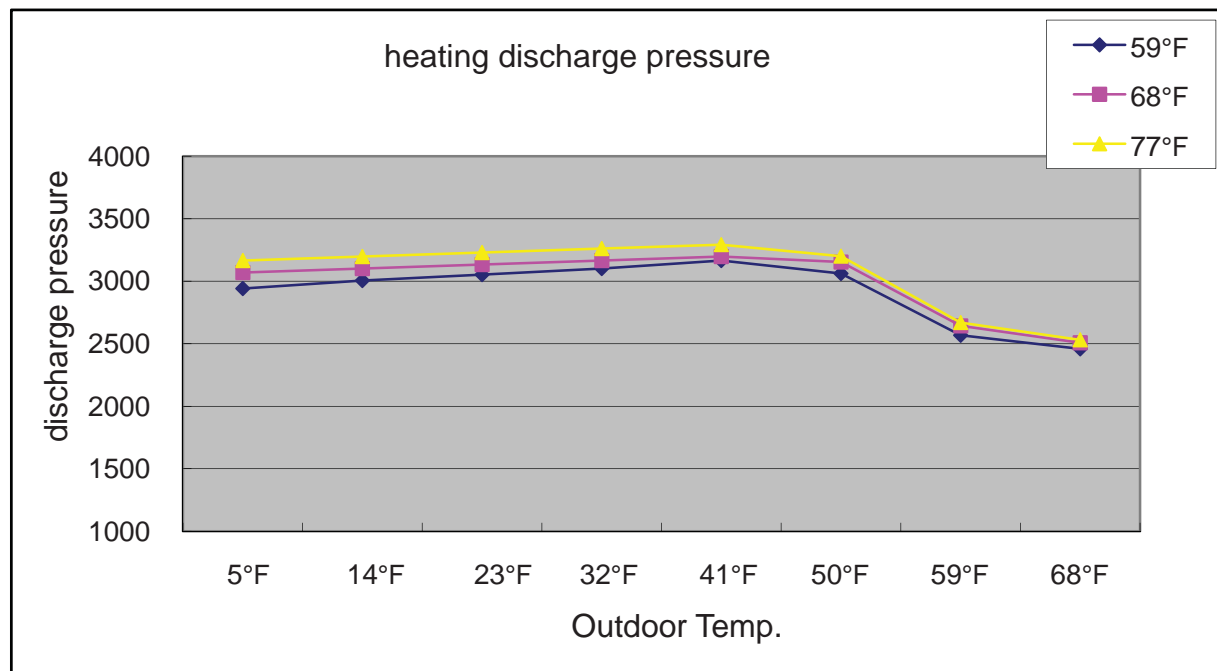
12.6 Heating power consumption value- temperature curves

Power consumption value-temp. table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	59°F	68°F	77°F
5°F	881	949	1037
23°F	1057	1044	1261
41°F	1193	1356	1437
44.6/42.8°F	1094	1204	1315
59°F	628	688	748
68°F	463	482	524
77°F	465	487	526



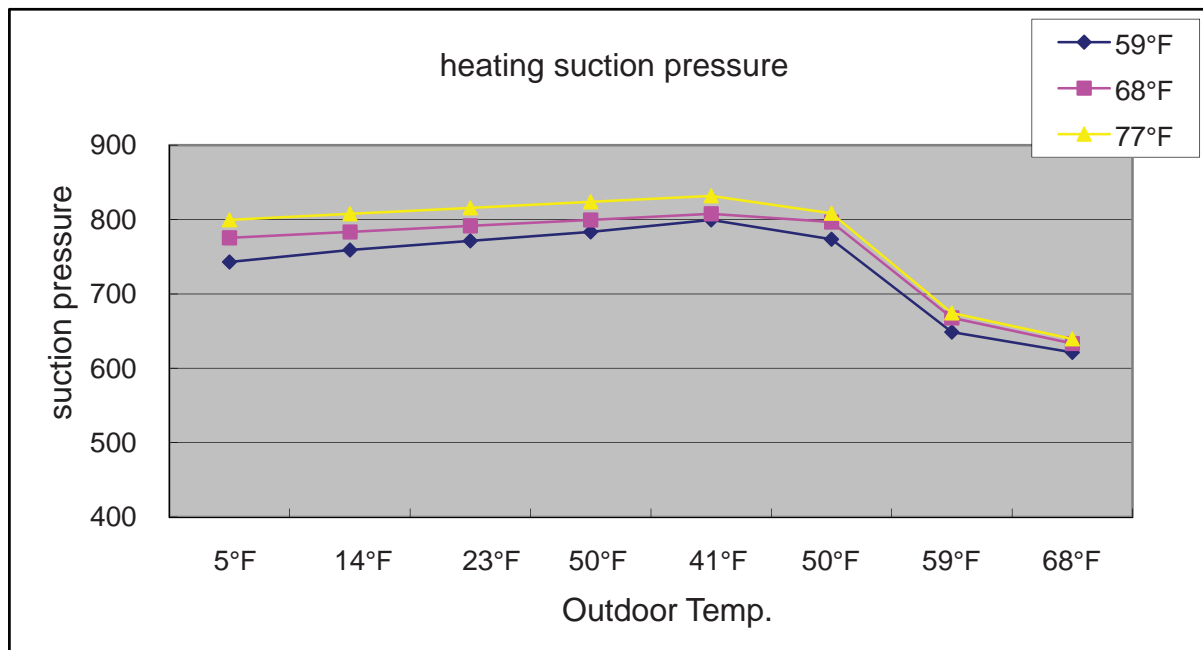
12.7 Heating discharge pressure curves

Heating discharge pressure. table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	59°F	68°F	77°F
5°F	2941	3069	3165
14°F	3005	3101	3197
23°F	3053	3133	3229
32°F	3101	3165	3261
41°F	3165	3197	3293
50°F	3062	3154	3200
59°F	2567	2644	2669
68°F	2459	2507	2531

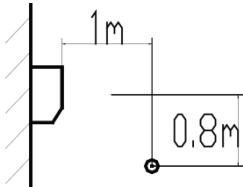


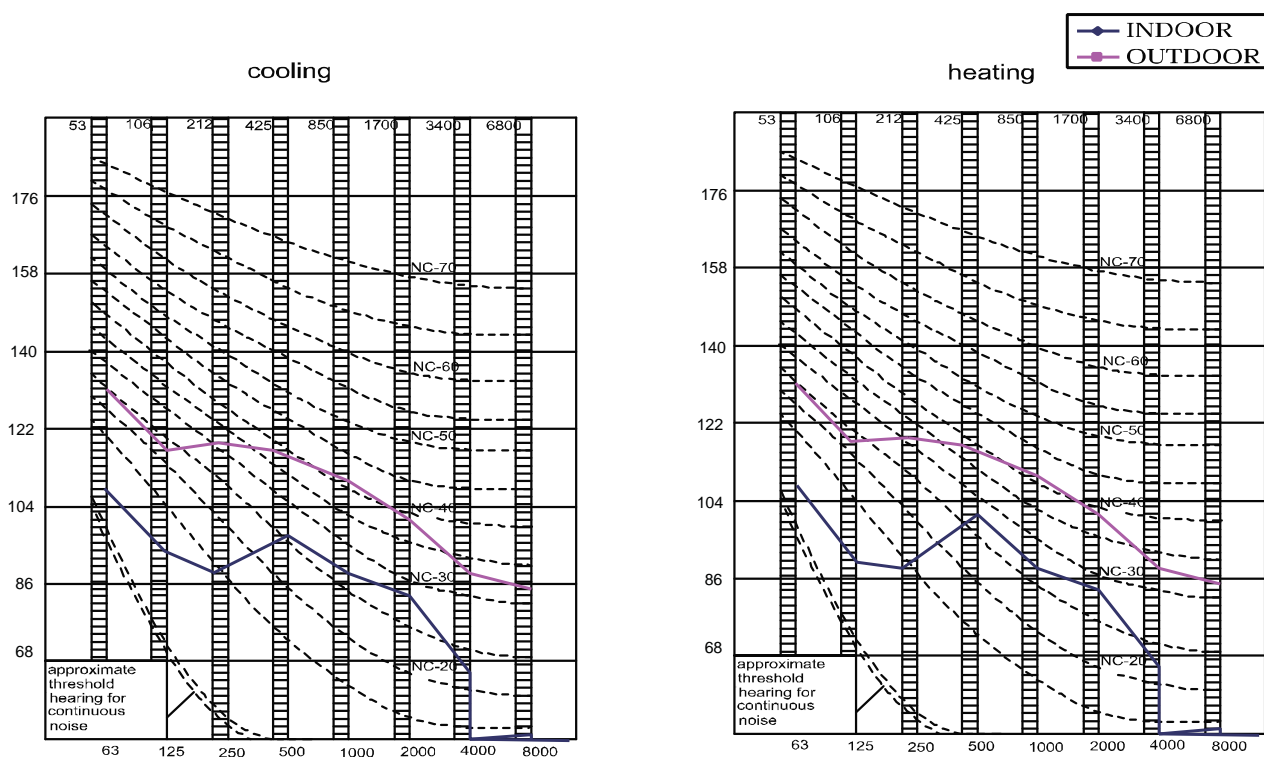
12.8 Heating suction pressure curves

Heating suction pressure. table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	59°F	68°F	77°F
5°F	743	775	799
14°F	759	783	808
23°F	771	791	816
50°F	783	799	824
41°F	799	808	832
50°F	774	797	808
59°F	649	668	674
68°F	621	633	639



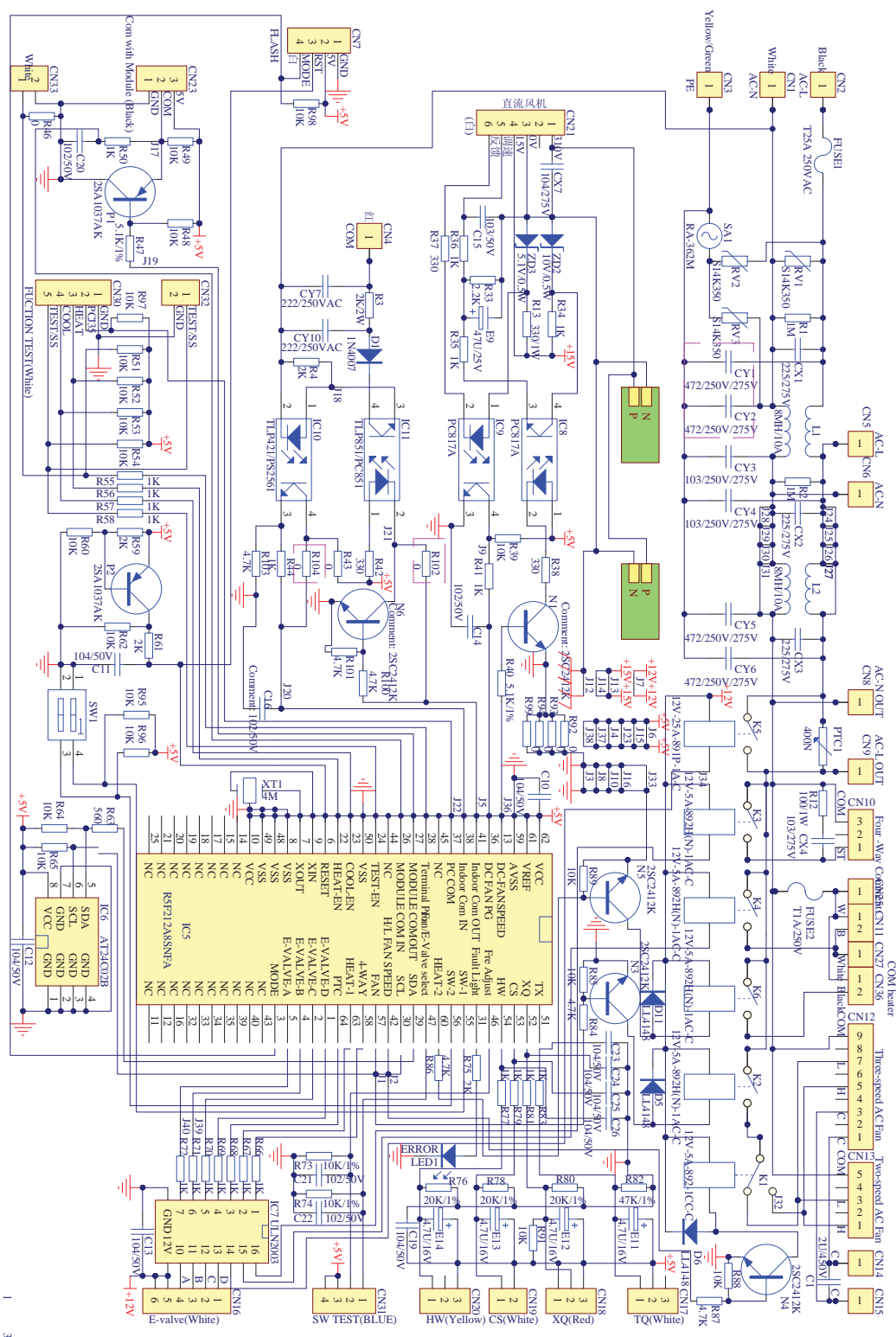
13.Sound level

Model	Sound power level(Indoor unit)		Sound power level (Outdoor unit) (cooling/heating)
	230V,60HZ	Measuring location of microphone	
	Cooling/heating		
1U12BE2ERA	62		/

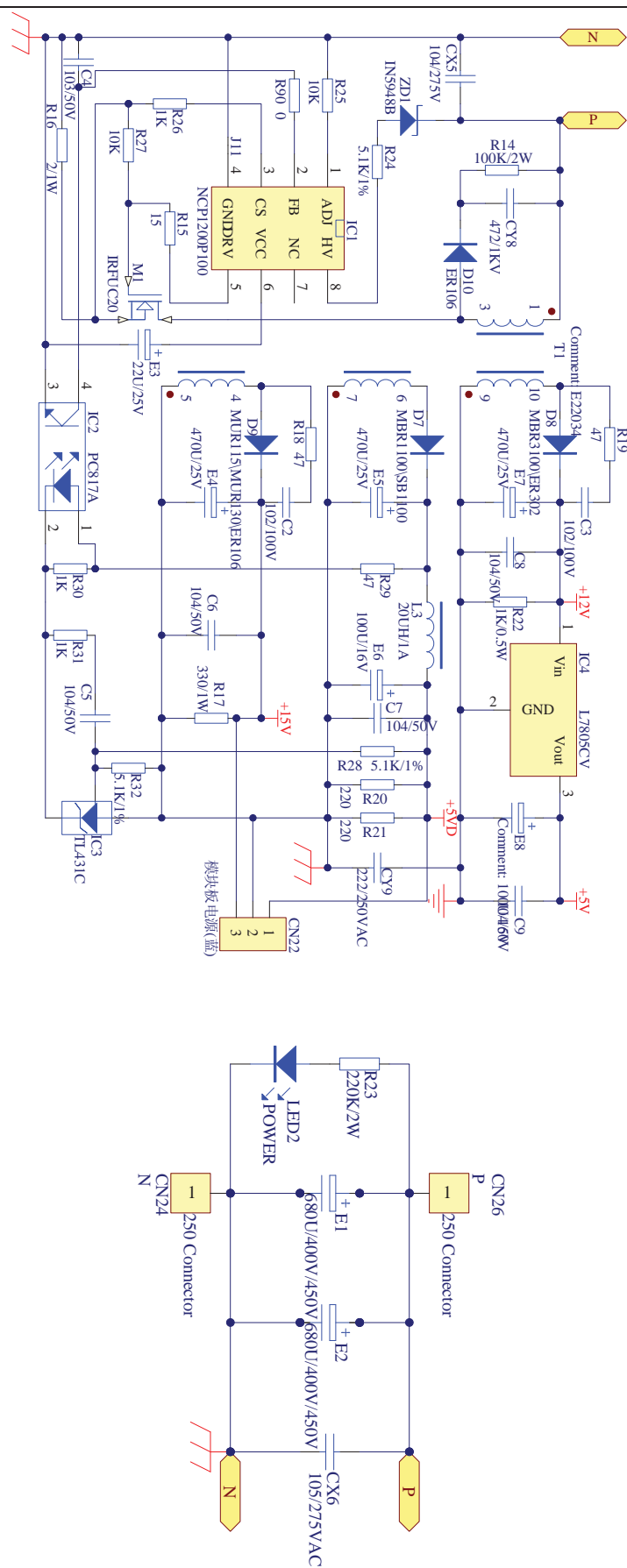


14 Circuit diagrams

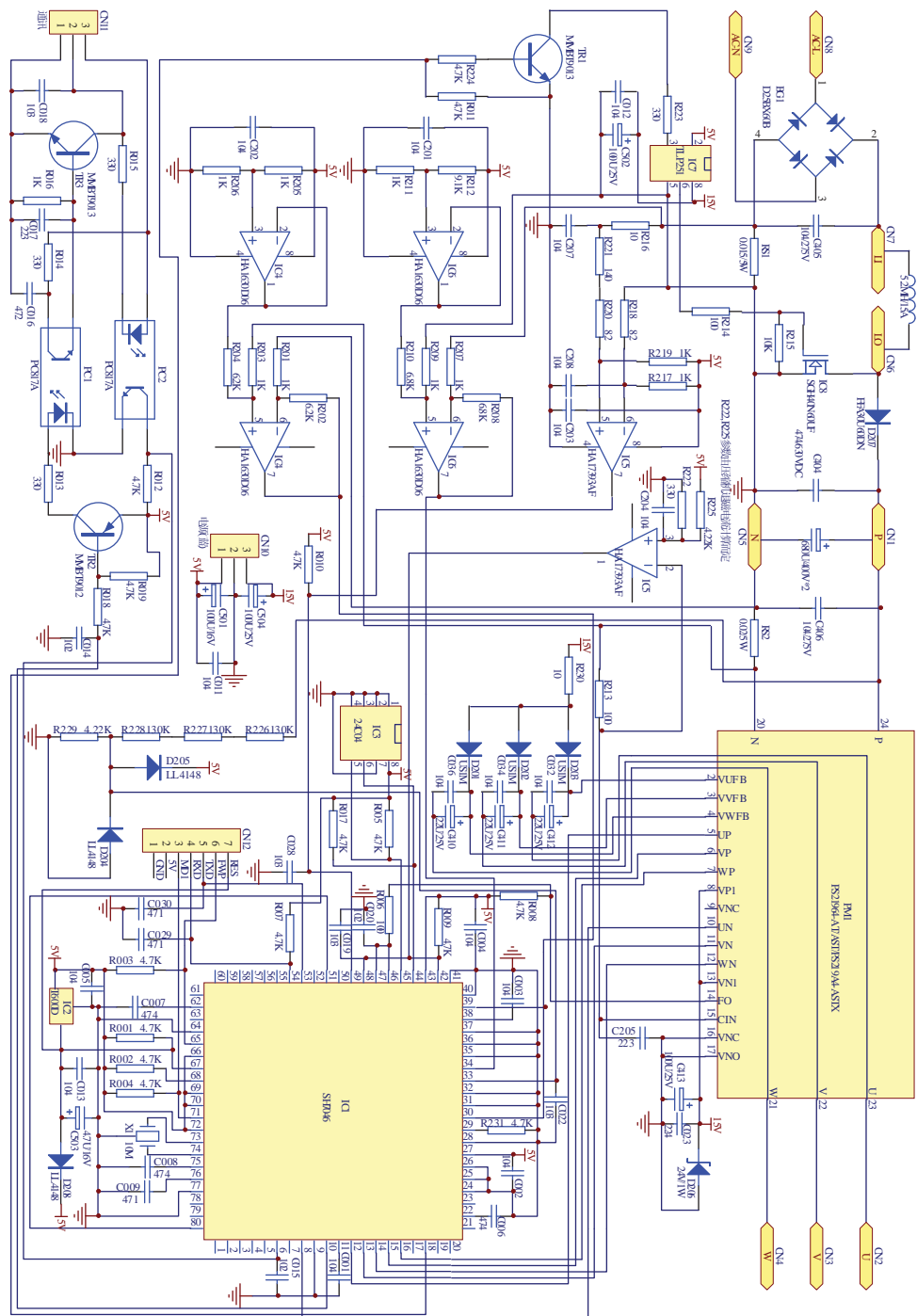
14.1 Outdoor unit control board Circuit Diagrams



1
3



14.2 Module board Circuit Diagram



Sincere Forever

Haier Group

Haier Industrial Park, No.1, Haier Road

266101, Qingdao, China_

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REMOVAL PROCEDURE

Wall Mounted Type DC Inverter FREE MATCH EK-Series SERIES:35 STEEL SHELL




WARNING

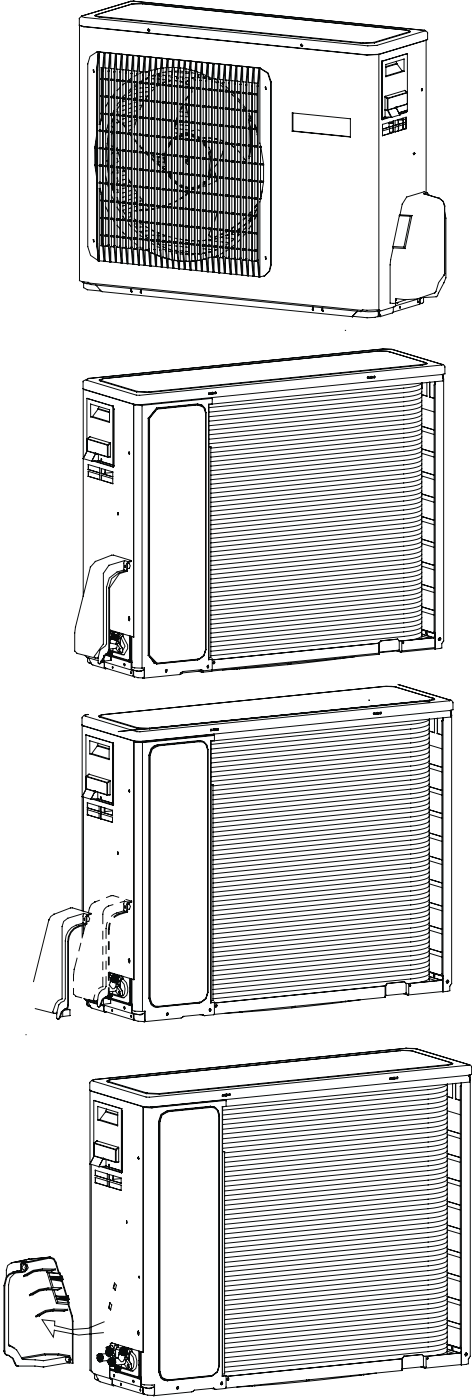
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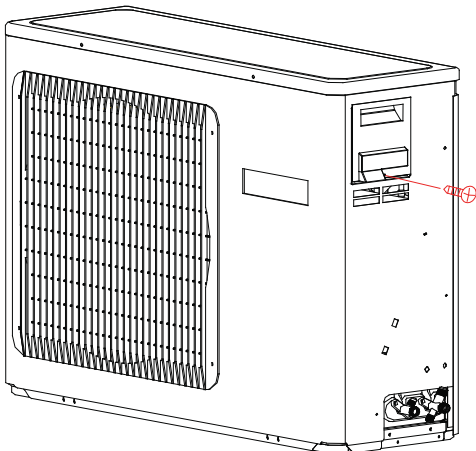
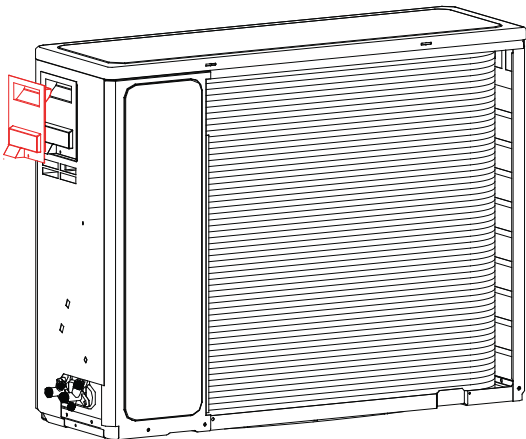
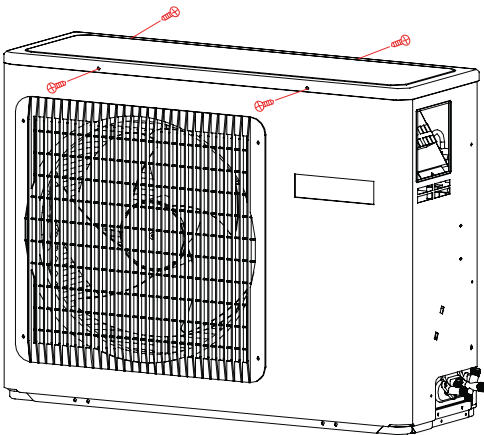
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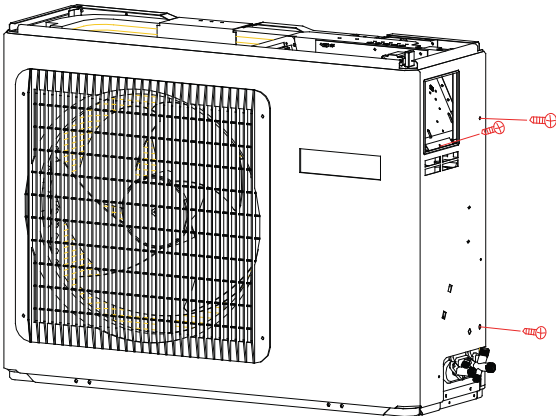
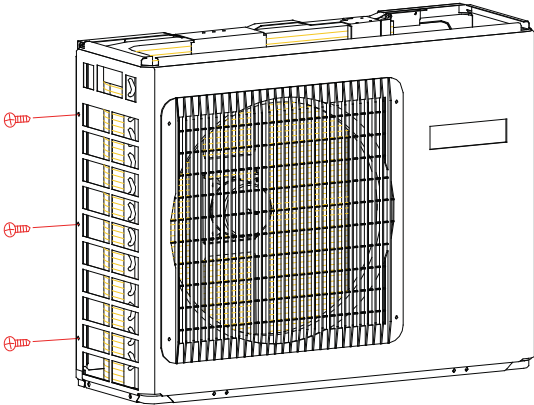
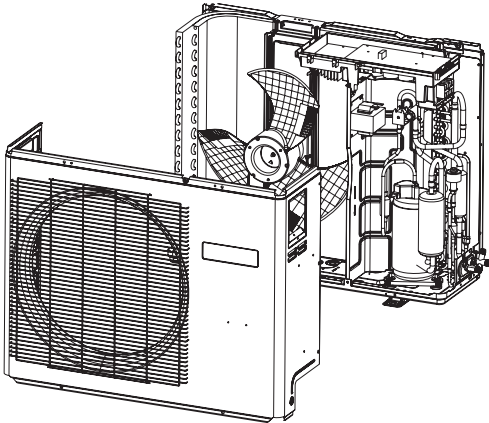
1. Removal of Outdoor panel

Procedure

 **Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.


Step	Procedure	Points
1. Features		
1	<div>Loosen the screw of the stop valve cover. Pull down the stop valve cover and remove it.</div> <div></div>	<div><ul style="list-style-type: none">■ Be careful not to cut your finger by the fins of the heat exchanger.■ The stop valve cover is united with the shelter.■ When assembling, make sure to fit the 5 hooks.</div>

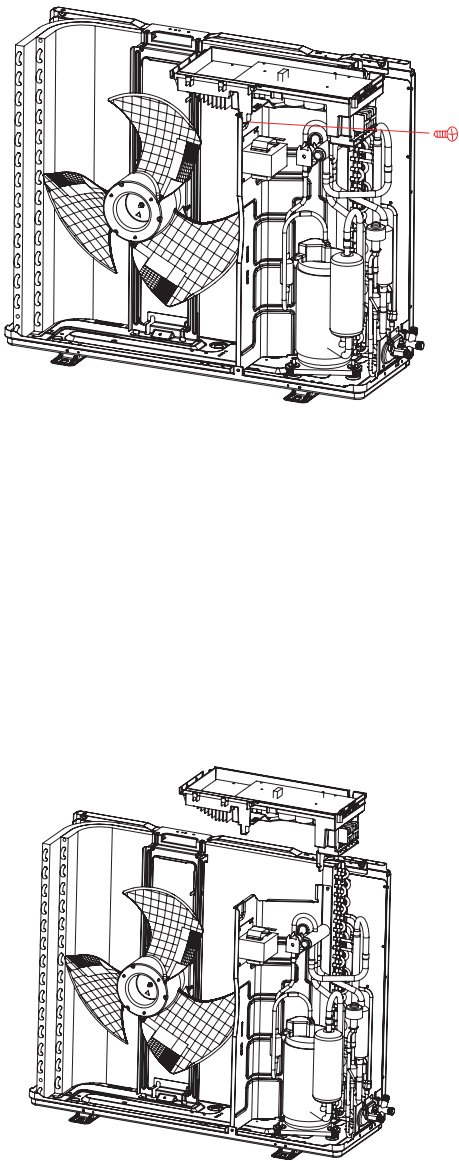
Step	Procedure	Points
2. Remove the panels.		
1	<div>Loosen the service cover screw and remove the service cover.</div> <div></div> <div></div>	
2	<div>Loosen the 4 screws and lift the top panel</div> <div></div>	

Step	Procedure	Points
		
3	Loosen the screws of the panel.	
		
4	Pull and remove the front panel.	
		

2. Removal of Electrical Box


Procedure

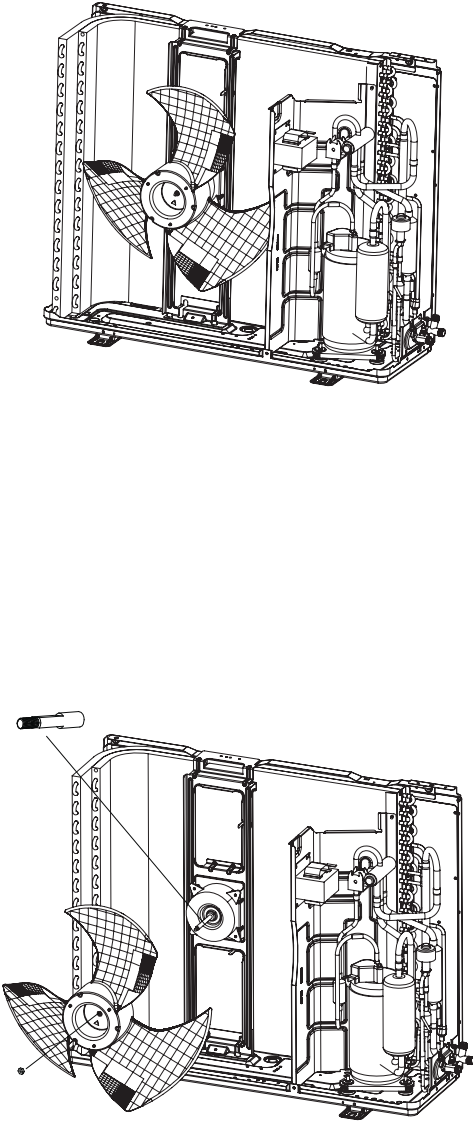
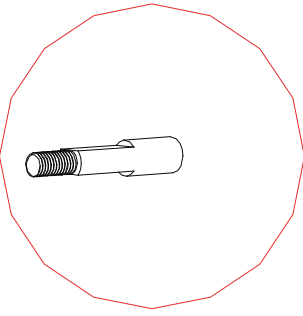
 **Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
1	<div><p>Remove the fixing screws</p><p>Then lift the electrical box</p></div> <div></div>	

3. Removal of Fan and Fan Motor


Procedure

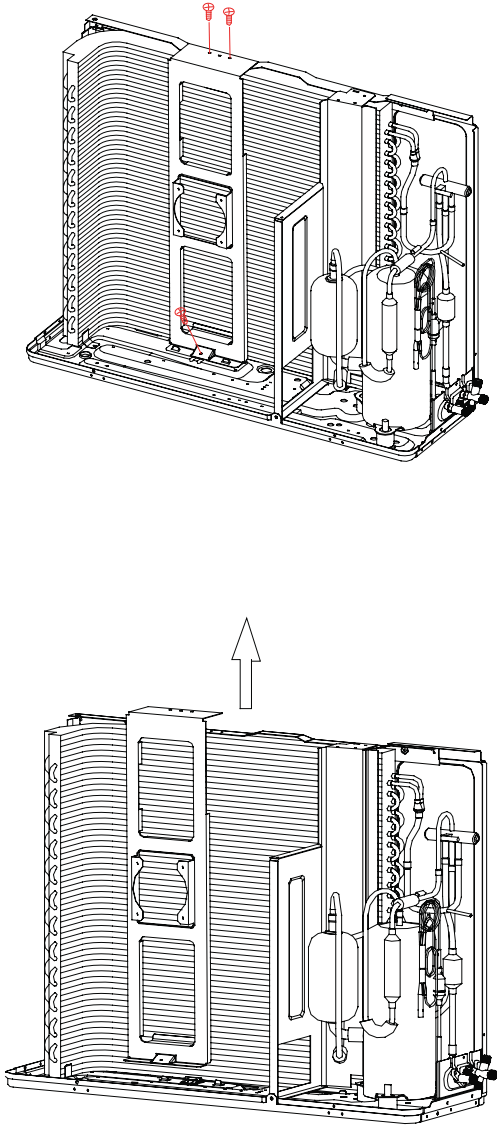
 **Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

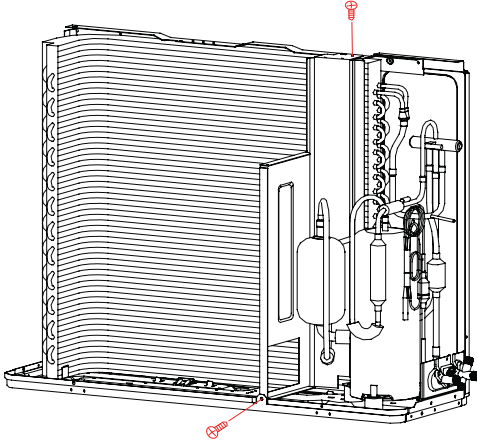
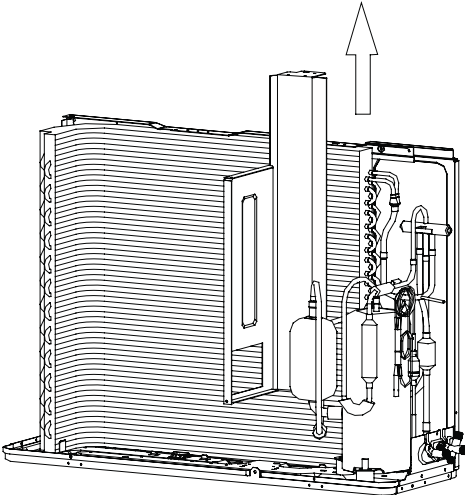
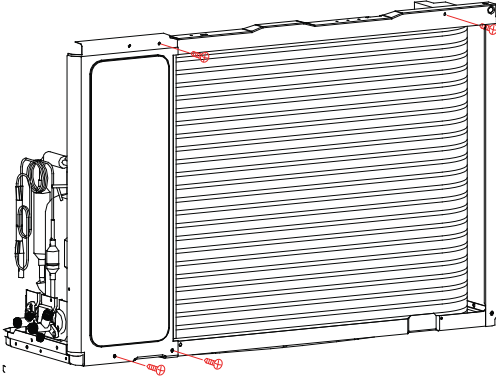
Step	Procedure	Points
1	<div>Loosen the fixing screw and remove the fan</div> <div></div>	<div></div> <div><p>■ Put the lead wire through the back of the motor when assembling. (so as not to be entangled with the propeller fan)</p></div>

4. Removal of fan motor brcked and partition

Procedure

 **Warning** Be sure to wait 10 minutes or mo
before disassembling work.

Step	Procedure	Points
1	<div>Loosen the fixing screws and lift the fan motor bracket.</div> <div></div>	

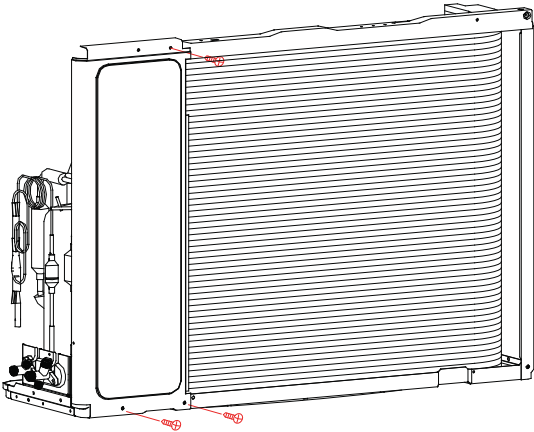
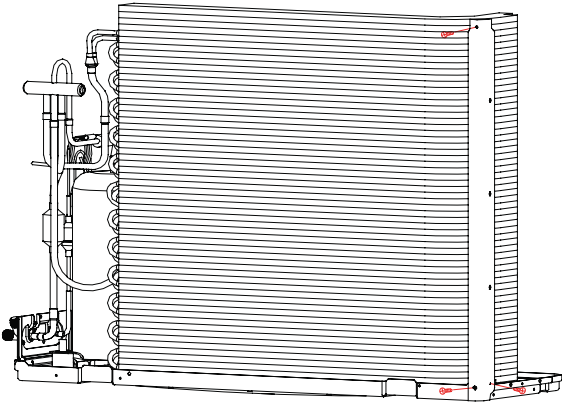
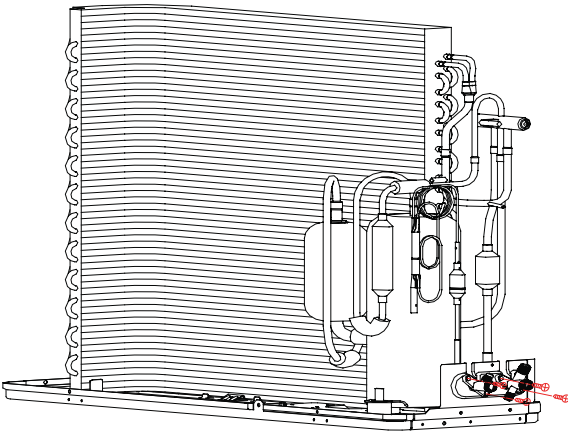
Step		Procedure	Points
3	Loosen the 2 screws		
4	The partition plate has a hook on the lower side.Lift and pull the partition plate to remove.		■ When assembling ,fit the lower hook into the bottom frame .
5	Loosen the marked fixing screws		

5. Removal of compressor and heat exchanger

Procedure



Warning Be sure to wait 10 minutes or more after tu before disassembling work.

Step	Procedure	Points
1	Loosen the marked screw .  	
2	Cut down the coneceting pipe and pull out the compressor and remove the valve bracket . 	

Step	Procedure	Points
3	Loosen the marked fixing screw .	
4	Loosen the fixing hook and remove the heat exchanger .	

